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*Catalogue of the Wheeler Gift of
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EDITED BY

WILLIAM D. WEAVER

Member American Institute of Electrical Engineers

WITH INTRODUCTION, DESCRIPTIVE AND CRITICAL NOTES

BY

BROTHER POTAMIAN, Sc.D., Lond.

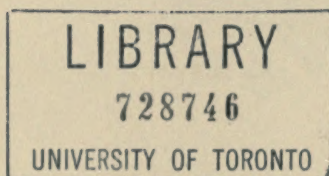
Professor of Physics, Manhattan College

VOLUME II



NEW YORK: AMERICAN INSTITUTE
OF ELECTRICAL ENGINEERS. 1909

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SECTION II

Excerpts from Periodicals—Miscellanea

SECTION II

Excerpts from Periodicals—Miscellanea

2448. **Wallis, John.** (1616-1703.) Letter to Captain Edmund Halley, concerning the captain's map of magnetick variations, and some other things relating to the magnet. (Philos. Trans. Roy. Soc., 1702, Vol. 23, pp. 1106-1112.) 4to. *London, 1704*
Gellibrand's determination of magnetic declination; reasons for believing that the mariner's compass was invented by an Englishman.
—See also 217.
2449. **Gray, Stephen.** (? -1736.) New electrical experiments. (Abstr. Philos. Trans. Roy. Soc., 1719-1733, Vol. 6, pt. 2, pp. 7-27.) 4to. *London, 1734*
Interesting list of bodies with which the experiments were made, p. 27.
2450. **A new barometer.** (Abstr. Philos. Trans. Roy. Soc., 1719-1733, Vol. 6, pt. 2, pp. 28-34.) 1 table. 4to. *London, 1734*
Application of the barometer to measurement of heights above sea-level.
2451. **Magneticks.** (Abstr. Philos. Trans. Roy. Soc., 1719-1733, Vol. 6, pt. 2, pp. 1-23.) 4to. *London, 1734*
"Variation" in London, in the Baltic, Hudson's Bay; numerous observations with the dipping-needle.
2452. **Eames, John.** (? -1744.) An account of a book entitled, *Traité physique et historique de l'Aurore Boréale*, par M. de Mairan. Suite des Mémoires de l'Académie Royale des Sciences, année 1731; or, A philosophical and historical treatise concerning the Aurora Borealis, by Mr. de Mairan, being a supplement to the Mémoires of the Academy of Sciences for the year 1731. (Philos. Trans. Roy. Soc., Vol. 38, pp. 243-256.) 4to. *London, 1735*
The writer holds that aurorae are due to the extension of the solar atmosphere, remarks on the height of our atmosphere and on the altitude at which aurorae appear. (See No. 382.)

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2453. **Electricity.** (Abstr. Philos. Trans. Roy. Soc., 1732-1744, Vol. 8, pt. 2, pp. 393-632.) 4 plates, 1 tab. 4to. *London, 1747*
Early experiments on *frictional electricity* by Wheeler and others.
2454. **Electricity.** (Abridg. Philos. Trans. Roy. Soc., 1743-1750, Vol. 10, pt. 2, pp. 269-428.) 3 plates. 4to. *London, 1756*
Includes plates of *frictional machines* and electrical apparatus.
2455. **Magneticks.** (Abridg. Philos. Trans. Roy. Soc., 1743-1750, Vol. 10, pt. 1, Chapt. 4, pp. 1-20.) 1 plate. 4to. *London, 1756*
2456. **Darwin, Erasmus.** (1731-1802.) Remarks on the opinion of Henry Eccles, concerning the ascent of vapour. (Philos. Trans. Roy. Soc., Vol. 50, pp. 240-254.) 4to. *London, 1757*
Eccles maintained that every *particle* of a vapor has an *electric charge* which is the sole cause of its ascensional movement. (See No. 377.)
—See also 555.
2457. **Lane, T(imothy).** (1734-1807.) Description of an electrometer invented by Mr. Lane; with an account of some experiments made by him with it; in a letter to Benjamin Franklin. (Philos. Trans. Roy. Soc., Vol. 57, pp. 451-460.) 1 plate. 4to. *London, 1766*

Note on the principle of the author's unit-jar.
—See also 2506.
2458. **L'Epinasse, C.** Description of an improved apparatus for performing electrical experiments, in which the electrical power is increased, the operator entirely secured from receiving any accidental shocks, and the whole rendered more convenient for experiments than heretofore. (Philos. Trans. Roy. Soc., Vol. 57, pp. 186-191.) 1 plate. 4to. *London, 1767*
A method of protection from a Leyden jar discharge.
2459. **Priestley, Joseph.** (1733-1804.) An investigation of the lateral explosion and of the electricity communicated to the electrical circuit, in a discharge. (Philos. Trans. Roy. Soc., Vol. 60, pp. 192-210.) 4to. *London, 1770*
Some induction effects due to the discharge of a Leyden jar.
- 2460.—Experiments and observations on charcoal. (Philos. Trans. Roy. Soc., Vol. 60, pp. 211-228.) 4to. *London, 1770*
The electric conductivity of charcoal.
—See also 422, 2491.
2461. **Winn, J. L.** A letter to Dr. Benjamin Franklin, giving an account of the appearance of lightning on a conductor fixed from the summit of a mainmast of a ship down to the water. (Philos. Trans. Roy. Soc., Vol. 60, pp. 188-191.) 1 plate. 4to. *London, 1770*
Early use of a lightning conductor for the protection of ships.
2462. **Cavendish, Henry.** (1731-1810.) An attempt to explain some of the principal phenomena of electricity by means of an elastic fluid. (Philos. Trans. Roy. Soc., Vol. 61, pp. 584-677.) 1 plate. 4to. *London, 1771-1772*
Views on electrical theory of the celebrated English chemist and physicist;

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this is one of the few papers published by the author during his lifetime.

—See also 2132, 2465, 2487, 3803.

2463. **Henley, William** (? -1779.) Experiments concerning the different efficacy of pointed and blunted rods, in securing buildings against the stroke of lightning. (Philos. Trans. Roy. Soc., Vol. 64, pp. 133-152.) 1 plate. 4to. *London, 1773*
Pamphlet written during the London controversy of *Points v. Knobs*. Henley invented the "quadrant electrometer," or electric semaphore.
- 2464.—An account of some new experiments in electricity. (Philos. Trans. Roy. Soc., Vol. 64, pp. 389-431.) 1 plate. 4to. *London, 1774*
Experiments with Leyden jars, the electricity of the atmosphere and the conducting power of metals.
—See also 443, 2469, 2472.
2465. **Cavendish, Henry.** (1731-1810.) An account of some attempts to imitate the effects of the torpedo by electricity. (Philos. Trans. Roy. Soc., Vol. 66, pp. 196-225.) 1 plate. 4to. *London, 1775*
These experiments attracted considerable attention at the time and contributed largely towards settling the matter in debate.
—See also 2462.
2466. **Hutchins, Thomas.** (1730-1788.) Experiments on the dipping-needle. (Philos. Trans. Roy. Soc., Vol. 65, pp. 130-138.) 4to. *London, 1775*
Determination of magnetic dip in Hudson's Straits and other places in the vicinity of Hudson's Bay.
2467. **Lorimer, J(ohn).** (1732-1795.) Description of a new dipping-needle. (Philos. Trans. Roy. Soc., Vol. 65, pp. 79-84.) 4to. *London, 1775*
A dipping needle designed for use at sea.
—See also 594.
2468. **Fothergill, John.** (1712-1780.) An account of the magnetical machine contrived by the late Dr. Gowin Knight. (Philos. Trans. Roy. Soc., Vol. 66, pp. 591-599.) 1 plate. 4to. *London, 1776*
Remarks on the best form to give a compass needle.
2469. **Henley, W(illiam).** (? -1779.) Experiments and observations on a new apparatus, called a machine for exhibiting perpetual electricity, in a letter to Dr. Horsley. (Philos. Trans. Roy. Soc., Vol. 66, pp. 513-522.) 4to. *London, 1776*
Virtually a small plate condenser.
—See also 2463.
2470. **Nairne, Edward.** (1726-1806.) Experiments on water obtained from the melted ice of sea-water, to ascertain whether it be fresh or not; and to determine its specific gravity with respect to other water; also experiments to find the degree of cold in which sea-water begins to freeze. Addressed to Sir John Pringle. 8 pp. 4to. *(London) 1776*

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2471. **Cavallo, Tiberio.** (1749-1809.) New electrical experiments and observations, with an improvement of Mr. Canton's electrometer. (Philos. Trans. Roy. Soc., Vol. 67, pp. 388-400.) 4to.
London, 1777
Miscellaneous experiments on frictional electricity; also the author's portable "electrometer".
—See also 463, 2475, 2485.
2472. **Henley, W(illiam).** (? -1779.) Experiments and observations in electricity. (Philos. Trans. Roy. Soc., Vol. 67, pp. 85-143.) 1 plate. 4to.
London, 1777
Observations on Franklin's theory of the Leyden jar; bow and violin strings oppositely electrified; electrical origin of *water-spouts*.
—See also 2463.
2473. **Semi-globes; or, Electrical orbs.** iv+8 pp. 4to. *London, for A. Webb.*
London, 1777
Nothing electrical but the title.
2474. **Wilson, Benjamin.** (1708-1788.) New experiments upon the Leyden phial, respecting the termination of conductors. (Philos. Trans. Roy. Soc., Vol. 68, pp. 999-1012.) 2 plates. 4to.
London, 1778
Paper connected with the author's contention that lightning-conductors should terminate in *knobs* rather than in *points*; Leyden jars *repaired*.
—See also 334.
2475. **Cavallo, Tiberio.** (1749-1809.) An account of some new experiments in electricity, with the description and use of two new electrical instruments. (Philos. Trans. Roy. Soc., Vol. 70, pp. 15-291.) 1 plate. 4to.
London, 1779
Electrical dust figures of Prof. Lichtenberg of Goettingen; electrometer for observations of atmospheric electricity.
—See also 2471.
2476. **Ingenhousz, Jan.** (1730-1799.) Improvements in electricity. (Philos. Trans. Roy. Soc., Vol. 69, pp. 661-673.) 4to.
London, 1779
The improvements have reference to the plate-machine (Ramsden's) instead of the globular or cylindrical form previously in use.
- 2477.—On some new methods of suspending magnetical needles. (Philos. Trans. Roy. Soc., Vol. 69, pp. 537-546.) 1 plate. 4to.
London, 1779
Reference to *laminated* magnets; liquid damping, thin tubular magnets.
2478. **Swift, Wm.** Account of some experiments in electricity. (Philos. Trans. Roy. Soc., Vol. 69, pp. 454-461.) 2 plates. 4to.
London, 1779
The author connects a conductor to the rubber of the electrical machine to collect *negative* electricity.
2479. **Chambers, E(phraim).** (? -1740.) Cyclopaedia: Articles Electricity and Magnetism. (Vol. III, 25 pp.) Folio.
London, 1781
These articles contain much general information.

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2480. **Brook, Abraham.** (fl. 1789.) Account of a new electrometer. (Philos. Trans. Roy. Soc., Vol. 72, pp. 384-388.) 2 plates. 4to. London, 1782
For use in special electrostatic work.
—See also 553.
2481. **Volta, A(lessandro).** (1745-1827.) Del condensatore, ossia del modo di render sensibilissima la pui debole elettricità sia naturale, sia artificiale. (Memoria divisa in due parti, letta nella Società R. di Londra.) (Philos. Trans. Roy. Soc., Vol. 71, pp. 237-280.) 4to. London, 1782
Description of the author's *condensing electroscope*.
- 2481a.—(English translation.) Of the method of rendering very sensible the weakest natural or artificial electricity. (Philos. Trans. Roy. Soc., Vol. 72, pp. vii-xxxiii.) 4to. London, 1782
—See also 428, 2493, 2497.
2482. **Morgan, W(illiam).** (? -1883.) Electrical experiments made in order to ascertain the non-conducting power of a perfect vacuum. (Philos. Trans. Roy. Soc., Vol. 75, pp. 272-278.) 1 plate. 4to. London, 1785
The author concludes some experiments made by him on the electric discharge in a rarefied medium by saying that "we cannot suppose a perfect vacuum to be a perfect conductor without supposing an absurdity."
2483. **Bennet, Abraham.** (1750-1799.) Description of a new electrometer. (Philos. Trans. Roy. Soc., Vol. 77, pp. 26-34.) 3 plates. 4to. London, 1786
This is the author's well-known *gold-leaf electroscope*.
- 2484.—An account of a doubler of electricity, or a machine by which the least conceivable quantity of positive or negative electricity may be continually doubled, till it becomes perceptible by common electrometers, or visible in sparks. (Philos. Trans. Roy. Soc., Vol. 77, pp. 288-296.) 1 plate. 4to. London, 1787
This *doubler* embodies the fundamental principles of *influence* machines, such as those of Holtz and Wimshurst.
—See also 552, 2492.
2485. **Cavallo, T(iberio).** (1749-1809.) Of the methods of manifesting the presence and ascertaining the quality of small quantities of natural or artificial electricity. (Philos. Trans. Roy. Soc., Vol. 78, pp. 1-22.) 1 plate. 4to. London, 1787
The Bakerian lecture given in 1787; the author's pith-ball electroscope in which fine silver wire is used instead of linen thread; Bennet's gold-leaf and Volta's condensing electroscope; also Bennet's doubler.
- 2486.—Description of a new electrical instrument capable of collecting together a diffused or little condensed quantity of electricity. (Philos. Trans. Roy. Soc., Vol. 78, pp. 255-260.) 1 plate. 4to. London, 1788
The instrument here described is similar in principle but not in arrangement to Volta's condensing electroscope.
—See also 2471.

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2487. **Cavendish, H(enry).** (1731-1810.) On the conversion of a mixture of dephlogisticated and phlogisticated air into nitrous acid, by the electric spark. (Philos. Trans. Roy. Soc., Vol. 78, pp. 261-276.) 4to. London, 1788
Details of the celebrated experiment on the formation of nitric acid by the passage of electric sparks through a volume of air.
—See also 2462.
2488. **Gray, Edward Whitaker.** (1748-1806.) Observations on the manner in which glass is charged with the electric fluid and discharged. (Philos. Trans. Roy. Soc., Vol. 78, pp. 121-124.) 4to. London, 1788
Strictures on Franklin's theory of the Leyden jar.
2489. **Milner, Isaac.** On the production of nitrous acid and nitrous air. (Philos. Trans. Roy. Soc., Vol. 79, pp. 300-313.) 4to. London, 1789
Experiments suggested by those of Priestley and Cavendish.
2490. **Nicholson, W(illiam).** (1755-1815.) Experiments and observations on electricity. (Philos. Trans. Roy. Soc., Vol. 79, pp. 265-288.) 1 plate. 4to. London, 1789
Flap of silk used on frictional machines; the electric action of points; danger from the *return stroke*.
—See also 510.
2491. **Priestley, Joseph.** (1733-1804.) Experiments on the transmission of the vapour of acids through a hot earthen tube, and further observations relating to phlogiston. (Philos. Trans. Roy. Soc., Vol. 79, pp. 289-299.) 4to. London, 1789
Chemical paper of historical interest.
—See also 2459.
2492. **Bennet, A(braham).** (1750-1799.) A new suspension of the magnetic needle, intended for the discovery of minute quantities of magnetic attraction, also an air vane of great sensibility; with new experiments on the magnetism of iron filings and brass. (Philos. Trans. Roy. Soc., Vol. 82, pp. 81-98.) 1 plate. 4to. London, 1792
The suspension used is a *spider's thread*; experiments made with such a magnetoscope; the author (a clergyman) was the inventor of the gold-leaf electroscope.
—See also 2483.
2493. **Volta, A(lessandro).** (1745-1827.) Account of some discoveries made by Mr. Galvani, with experiments and observations on them. In two letters to Cavallo. (Philos. Trans. Roy. Soc., Vol. 83, pp. 10-44.) 4to. London, 1793
Two letters on Galvani's discoveries addressed to Mr. Tiberio Cavallo of London.
—See also 2481.
2494. **Read, John.** Experiments and observations made with the doubler of electricity, with a view to determine its real utility, in the investigation of the electricity of atmospheric air, in

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different degrees of purity. (Philos. Trans. Roy. Soc., Vol. 84, pp. 266-274.) 4to. *London, 1794*

The author finds that air, infected with animal respiration or vegetable putrefaction, is always negatively electrified while the surrounding atmosphere is positively electrified.

—See also 585.

2495. MacDonal*d*, John. (1759-1831.) Observations of the diurnal variation of the magnetic needle at Fort Marlborough, in the island of Sumatra. (Philos. Trans. Roy. Soc., 1796, pp. 340-349.) 4to. *London, 1796*

Tables of observations of magnetic declination made in 1794-1795 together with remarks on theories of terrestrial magnetism.

- 2495a.—Observations of the diurnal variation of the magnetic needle, in the island of St. Helena; with a continuation of the observations at Fort Marlborough, in the island of Sumatra. (Philos. Trans. Roy. Soc., 1798, pp. 397-402.) 4to. *London, 1798*

The observations at St. Helena extended over a period of one month of the year 1796; Halley's theory recommended.

—See also 689, 2540.

2496. View of the telegraph erected on the admiralty office, Charing Cross, in Febr., 1796. By an officer on duty. 1 plate. L. folio. *London, 1796*

This is a mechanical telegraph; the letters were made by opening and closing ports in a vertical frame, which ports were viewed through a telescope at the distant station.

2497. Volta, A(lessandro). (1745-1827.) On the electricity excited by the mere contact of conducting substances of different kinds. (In una lettera a S. G. Banks, F. R. S. Letta il 26 giugno. 1800. Como, 20 marzo, 1800.) (Philos. Trans. Roy. Soc., 1800, pp. 403-431.) 1 plate. 4to. *London, 1800*

This is Volta's famous letter, written in French, to Sir Joseph Banks announcing the invention of the voltaic pile, here called *Organe électrique artificiel*. (See No. 731.)

—See also 2481.

2498. Arithmetical tables, with questions for examination and explanatory notes. 9. edition. 35 pp. 24mo. *London, (1800)*
A pamphlet on English weights and measures.

2499. Bischoff, Christian Heinrich Ernst. (? -1774.) Commentatio de usu galvanismi in arte medica. (Sue, Hist., Vol. III., pp. 67-142.) 2 plates. 8vo. *Jena, 1801*

The voltaic battery and its use in the cure of nervous disorders. (See No. 630a.)

2500. Davy, (Sir) Humphry. (1778-1829.) An account of some galvanic combinations, formed by the arrangement of single metallic plates and fluids, analogous to the new galvanic apparatus of Mr. Volta. (Philos. Trans. Roy. Soc., 1801, pp. 397-402.) 4to. *London, 1801*

Various combinations of small plates of silver, copper, lead with cloths between them soaked with different liquids.

—See also 634, 2511, 2514, 2518, 2543, 2548, 2566, 2573, 2604.

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2501. **Wollaston, William Hyde.** (1766-1828.) Experiments on the chemical production and agency of electricity. (Philos. Trans. Roy. Soc., 1801, pp. 427-434.) 4to. London, 1801
Imitation of "galvanic" phenomena by common electricity.
—See also 2586.
2502. **Alexandre, (Jean).** New telegraph at Tours. (English Chronicle & Whitehall Evening Post, June 19-22, 1802.) Folio. London, 1802
Short note on sympathetic dial-telegraph which is fully described in the (London) *Electrician*, April 21, 1883. (Vol. 10, p. 539).
2503. **Geoffroy Saint-Hilaire, Étienne.** (1772-1844.) Mémoire sur l'anatomie comparée des organes électriques de la raie torpille, du gymnote engourdisant, et du silure trembleur. (Annales du Museum d'Hist. Nat., Year I., pp. 392-407.) 1 plate. 4to. Paris, 1803
Paper on the physiology of electric fishes.
2504. **Woods, Samuel.** Essay on the Franklinian theory of electricity. (Philos. Mag., Ser. I., Vol. 17, pp. 97-113.) 8vo. London, 1803
Advantages and defects of the Franklinian theory.
2505. **Flinders, Mathew.** (1760-1814.) Concerning the differences in the magnetic needle, on board the *Investigator*, arising from an alteration in the direction of the ship's head. (Philos. Trans. Roy. Soc., 1805, pp. 186-197.) 4to. London, 1805
It is here supposed that the attractive power of the different bodies in a ship which are capable of affecting the compass needle, acts at a point similar to that of the center of gravity of ordinary masses.
2506. **Lane, Timothy.** (1734-1807.) On the magnetic attraction of oxides of iron. (Philos. Trans. Roy. Soc., 1805, pp. 281-284.) 4to. London, 1805
"My intention in this communication is to prove generally that mere oxides of iron are not magnetic."
—See also 2457.
2507. **Coulomb, (Charles Augustin).** (1736-1806.) Resultat des différentes méthodes employées pour donner aux lames et aux barreaux d'acier le plus grand degré de magnétisme. (Mém. Institut. Paris, Cl. Sc. Math. et Phys., Vol. 6, pp. 399-422.) 4 plates. 4to. Paris, 1806
Methods of making powerful steel magnets.
—See also 490.
2508. **Gilpin, George.** Observations on the variation and on the dip of the magnetic needle, made at the apartments of the Royal Society, between the years 1786 and 1805 inclusive. (Philos. Trans. Roy. Soc., 1806, pp. 385-419.) 4to. London, 1806
These notes include remarks on the "variation" observations of Borough, Gunter and Gellibrand.
2509. **Robertson, James.** Observations on the permanency of the compass at Jamaica. (Philos. Trans. Roy. Soc., 1806, pp. 348-356.) 4to. London, 1806
Reference to the magnetic observations of Columbus and of Halley.

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2510. **Description** of the nature and use of Hadley's quadrant; containing the theory and a demonstration of the principles on which the instrument is founded. 32 pp. 1 plate. 12mo.
London, 1806
Also a short historical notice of the *quadrant*.
2511. **Davy, (Sir) Humphry.** (1778-1829.) On some chemical agencies of electricity. (Philos. Trans. Roy. Soc., 1807, pp. 1-56.) 1 plate. 4to.
London, 1807
The Bakerian lecture for 1806; mode of action of the voltaic pile; electrical phenomena accompanying earthquakes and volcanic eruptions.
—See also 2500.
2512. **Duncan, J. S.** Proposal for the establishment of a national Museum. (Philos. Mag., Ser. I., Vol. 29, pp. 296-298.) 8vo.
London, 1807
This concluding paper refers to magnetic and electrical apparatus.
2513. **Pasley, (Sir) C(harles) W(illiam).** (1780-1861.) A polygrammatic telegraph for day signals. (Philos. Mag., Ser. I., Vol. 29, pp. 292-296.) 8vo.
London, 1807
Signals mechanically transmitted by means of two arms fixed to the top of a vertical post.
—See also 2520, 2557, 2568, 4379.
2514. **Davy, (Sir) Humphry.** (1778-1829.) On the decomposition and composition of the fixed alkalis. (Philos. Trans. Roy. Soc., 1808, pp. 1-44.) 4to.
London, 1808
Properties of potassium and sodium.
- 2515.—**Electro-chemical researches, on the decomposition of the earths with observations on the metals obtained from the alkaline earths and on the amalgam procured from ammonia.** (Philos. Trans. Roy. Soc., 1808, pp. 333-370.) 4to.
London, 1808
Composition of the alkaline earths; their chemical properties said to depend on their electrical powers; a theory of the phenomena of volcanoes.
—See also 2500.
2516. **Brande, William T(homas).** (1788-1866.) Observations on albumen, and some other animal fluids; with remarks on their analysis by electro-chemical decomposition. (Philos. Trans. Roy. Soc., 1809, pp. 373-384.) 4to.
London, 1809
List of experiments made with a battery of 20 plates each of which was four feet by two feet.
—See also 900, 2524, 2957.
2517. **Children, John George.** (1777-1852.) An account of some experiments, performed with a view to ascertain the most advantageous method of constructing a voltaic apparatus for the purposes of chemical research. (Philos. Trans. Roy. Soc., 1809, pp. 32-38.) 4to.
London, 1809
The author's battery consisted of 20 pairs of zinc and copper plates, each plate being four feet high and two feet wide. The exciting liquid was a

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mixture of three parts of nitric and one part of sulphuric acid diluted with 30 parts of water, the quantity of liquid used being 120 gallons.
—See also 2530.

2518. **Davy**, (Sir) Humphry. (1778–1829.) On some new electro-chemical researches on various subjects, particularly the metallic bodies from the alkalies and earths, and on some combinations of hydrogen. (Philos. Trans. Roy. Soc., 1810, pp. 401–415.) 2 plates. 4to. London, 1810
Arguments are given for considering potassium and sodium elementary bodies.
—See also 2500.
2519. **Forster**, B. M. Description of a method of fitting up in a portable form the electric column lately invented by J. A. de Luc. Also an account of several experiments made with it. (Philos. Mag., Ser. I., Vol. 35, pp. 205–210.) 8vo. London, 1810
Description of De Luc's *dry pile*.
2520. **Pasley**, (Sir) C(harles) W(illiam). (1780–1861.) Description of the French telegraphs used on the coasts of Flanders, etc., with observations on the same, and a plan of a polygrammatic telegraph on a new construction. (Philos. Mag., Ser. I., Vol. 35, pp. 339–341.) 1 plate. 8vo. London, 1810
Designs of mechanical or semaphore telegraphs.
—See also 2513.
2521. **Marum**, (Martin) van. (1750–1837.) Catalogue des plantes, cultivées au printemps de 1810 dans le jardin de M. van Marum à Harlem. 64 pp. 8vo. Harlem, 1810
Pamphlet of botanical interest written by the celebrated physicist.
—See also 461, 2542.
2522. **Walker**, A(dam). (1731–1821.) Analysis of a course of lectures in Natural and Experimental philosophy. Lectures VII & VIII: Electricity. 15. edition. pp. 52–59. 8vo. London, 1810
Notes of a lecture on electricity. "A theory of greater plausibility is that lightning comes originally from the sun." p. 55.
—See also 618.
2523. **Forster**, Thomas. On M. de Luc's electric column. (Philos. Mag., Ser. I., Vol. 37, pp. 424–425.) 1 plate. 8vo. London, 1811
Experiments with a "dry" pile in which its action is found to depend on the state of the weather. (See No. 2525.)
—See also 728, 5006.
2524. **Brande**, W(illiam) T(homas). (1788–1866.) On some new electro-chemical phenomena. (Philos. Trans. Roy. Soc., 1814, pp. 51–61.) 1 plate. 4to. London, 1814
Experiments on the electrical state of different flames.
—See also 2516.
2525. **De Luc**, J(ean) A(ndré). (1727–1817.) On the variable action of the electric column. (Philos. Mag., Ser. I., Vol. 44, pp. 248–253.) 8vo. London, 1814
The "electric column" here referred to is the author's *dry pile*. (See No. 2523.)
—See also 661.

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2526. **Donovan, M(ichael).** (1790- ? .) Reflections on the inadequacy of the principal hypothesis to account for the phaenomena of electricity. (Philos. Mag., Ser. I., Vol. 44, pp. 334-351+401-407.) 1 plate. 8vo. *London, 1814*
Criticism of the Franklinian theory. "In the present dignified and improved state of natural science, everything should be rejected without reserve and without respect to authority that deviates from the standard of reason and experiment," p. 349. (See No. 2533.)
- 2526a.—Second reply to M. de Luc's observations in a paper entitled "Reflections," etc. (Philos. Mag., Ser. I., Vol. 46, pp. 13-14.) 8vo. *London, 1815*
—See also 730, 2960.
2527. **Howldy, Thomas.** Influence of atmospheric moisture on an electric column composed of discs of zinc and silver. (Philos. Mag., Ser. I., Vol. 43, pp. 363-364.) 8vo. *London, 1814*
—See also 2532.
2528. **Walker, Ed.** On electricity: in answer to M. Singer's remarks. (Philos. Mag., Ser. I., Vol. 43, pp. 364-365.) 8vo. *London, 1814*
Critical letter valuable only as a specimen of acrimonious writing. (See No. 725.)
2529. **Account** of an invention for reducing the expense of carriage on railways and other similar roads. 7 pp. 1 plate. 8vo. *Scarborough, 1814*
The invention consists of an endless chain passing over a driving pulley and round other pulleys fixed on the axles of the railway carriages. An illustration accompanies the letter.
2530. **Children, J(ohn) G(eorge).** (1777-1852.) An account of some experiments with a large voltaic battery. (Philos. Trans. Roy. Soc., 1815, pp. 363-374+409-415.) 4to. *London, 1815*
The battery consisted of 21 zinc-copper cells each plate having a surface of 32 square feet; experiments on the heating power of the battery; unable to charge a *Leyden jar* with the battery.
—See also 2517.
2531. **Crosse, Andrew.** (1784-1855.) Experiments in voltaic electricity. (Philos. Mag., Ser. I., Vol. 46, pp. 421-426.) 8vo. *London, 1815*
Deformation of a mercury globule when placed between the electrodes of a voltaic cell.
—See also 2538.
2532. **Howldy, Thomas.** On the fracture of electrical jars by spontaneous discharges. (Philos. Mag., Ser. I., Vol. 46, pp. 205-208.) 8vo. *London, 1815*
The author recognizes that a *Leyden jar* may be perforated when it *explodes spontaneously* as well as when discharged in the usual way.
- 2533.—On the Franklinian theory of the *Leyden jar*; with remarks on Mr. Donovan's experiments. (Philos. Mag., Ser. I., Vol. 46, pp. 401-408.) 8vo. *London, 1815*
The author justifies the Franklinian theory of the *Leyden jar* and criticises

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the "fallacious experiments" of Mr. Donovan on the inadequacy of existing theories to account for the phenomena of electricity. (See No. 2526.)

—See also 2527.

2534. **Ronalds**, (Sir) Francis. (1788–1873.) On correcting the rate of an electric clock by a compensation for changes of temperature. (Philos. Mag., Ser. I., Vol. 46, pp. 203–204.) 8vo.

London, 1815

A "dry" pile used to compensate for changes of temperature; also reference to Zamboni's "dry" pile.

- 2535.—On the electric column of Mr. De Luc. (Philos. Mag., Ser. I., Vol. 46, pp. 466–467.) 8vo.

London, 1815

Note on the influence of moisture on the action of a "dry" pile.

—See also 803, 2570, 2873, 2923, 3253.

2536. **Singer**, G(eorge) J(ohn). (1786–1817.) Correction of some errors in Mr. Singer's paper on the mechanical applications of the electric column. (Philos. Mag., Ser. I., Vol. 46, pp. 11–12.) 8vo.

London, 1815

Note correcting some typographical errors.

- 2537.—Some account of the electrical experiments of M. de Nelis. (Philos. Mag., Ser. I., Vol. 46, pp. 259–264.) ill. 8vo.

London, 1815

Experiments analogous to those of Lichtenberg and Lullin; explosive effects of discharge.

2538. **Singer**, George John (1786–1817) & Andrew **Crosse** (1784–1855). Account of some electrical experiments by M. de Nelis, of Malines in the Netherlands, with an extension of them. (Philos. Mag., Ser. I., Vol. 46, pp. 161–166.) 1 plate. 8vo.

London, 1815

Experiments showing the explosive effect of strong electric discharges.

—See also 725, 2531, 2536.

2539. **Walker**, Ez(ekiel). New outlines of chemical philosophy. (Philos. Mag., Ser. I., Vol. 45, pp. 424–432.) 1 plate. 8vo.

London, 1815

Description with diagram of the author's repulsion "electro-meter," some experiments with the same.

2540. **MacDonald**, John. (1759–1831.) Treatise explanatory of a new system of naval, military and political telegraphic communication of general application in which a comprehensive numerical dictionary calculated to express all the simple, compound and potential inflections of the verb. 77 pp. ill. 19 plates. 8vo.

London, 1817

Signaling by means of flags.

—See also 2495.

2541. **Description** of the safety lamp invented by Stephenson and now in use in Killingworth Colliery. Added: Account of the lamp constructed by Humphry Davy. 16+8 pp. 5 plates. 12mo.

London, 1817

Some points of interest relating to the safety lamp.

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2542. Marum, Martin van. (1750-1837.) Description d'une Marmite de Papin ou d'une chaudière qui retient la vapeur. 14 pp. 1 plate. 8vo. *Harlem, 1818*
Modified form of Papin's digester.
—See also 2521.
2543. Davy, (Sir) Humphry. (1778-1829.) Some observations on the formation of mists in particular situations. (Philos. Trans. Roy. Soc., 1819, pp. 123-144.) 1 plate. 4to. *London, 1819*
Deposition of moisture from the atmosphere in the vicinity of lakes and rivers.
—See also 2500.
2544. Sabine, (Sir) Edward. (1788-1883.) On irregularities observed in the direction of the compass needles of H. M. S. *Isabella* and *Alexander* in their late voyage of discovery and caused by the attraction of the iron contained in the ships. (Philos. Trans. Roy. Soc., 1819, pp. 112-133.) 1 plate. 4to. *London, 1819*
Observations made by Captain Flinders. (See No. 2558.)
—See also 945, 2558, 2633, 2642, 2698, 2710, 2715, 2772, 2784, 2788, 2808, 2829, 2852, 2874, 2907, 2941, 2978, 2986, 3036, 3068, 3105, 3145, 3254, 3314, 3363, 3413, 3471, 3515, 3589, 3647, 3672, 3702, 3795.
2545. Scoresby, William. (1789-1857.) On the anomaly in the variation of the magnetic needle as observed on ship-board. (Philos. Trans. Roy. Soc., 1819, pp. 96-106.) 4to. *London, 1819*
Capt. Flinders' rules.
—See also 805, 2559, 2582, 2670.
2546. Young, (Sir) Thomas. (1773-1829.) Remarks on the probabilities of error in physical observations, and on the density of the earth, considered especially with regard to the reduction of experiments on the pendulum. (Philos. Trans. Roy. Soc., 1819, pp. 70-95.) 4to. *London, 1819*
A point in the theory of probabilities; variation of g due to irregularities of the earth's surface.
—See also 643.
2547. Christie, S(amuel) H(unter). (1784-1865.) On the laws according to which masses of iron influence magnetic needles. (Philos. Trans. Roy. Soc., 1820, pp. 147-173.) 4to. *London, 1820*
The induced polarity of an iron mass is not considered sufficient to explain the behavior of a neighboring compass-needle; the experiments were made with a cast-iron ball which could be raised or lowered while the compass-needle could be placed on any radius, and its departure from the magnetic meridian estimated.
—See also 2565, 2597, 2603, 2619, 2625, 2673, 2703, 2720.
2548. Davy, (Sir) Humphry. (1778-1829.) On the magnetic phenomena produced by electricity. (Philos. Mag., Ser. I., Vol. 58, pp. 43-50.) 8vo. *London, 1820*
In a foot-note, the author refers to *Romagnosi's* observation made in Trent

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in 1802 that an insulated wire connected with the pole of a battery deflects a magnetic needle. *Mojon* of Genoa is quoted as having rendered a steel needle magnetic by placing it for a long time in a voltaic circuit. Compare *Izarn, Manuel du Galvanisme*, 1804. (See No. 664.)

- 2548a.—The same paper. (*Philos. Trans. Roy. Soc.*, 1821, pp. 7-19.)
4to. *London*, 1821
- 2548b.—Sur les phénomènes magnétiques par l'électricité Extrait d'une lettre adressée à W. H. Wollaston. (*Journ. Phys. Chim. et d'Hist. Nat.*, Vol. 93, pp. 226-240; Vol. 94, pp. 72-81.) 8vo.
Paris, 1821-1822
- 2548c.—Further research on the magnetic phenomena produced by electricity, with some new experiments on the properties of electrified bodies in their relations to conducting powers and temperature. (*Philos. Trans. Roy. Soc.*, 1821, pp. 425-439.) 4to. *London*, 1821
Magnetism developed in various conductors by the passage of the electric current; chain of *alternate links of silver and platinum*.
—See also 2500.
2549. Faraday, M(ichael). (1791-1867.) On the connexion of electric and magnetic phenomena. (*Quart. Journ. Sc.*, Vol. X, pp. 361-364.) 1 plate. 8vo. *London*, 1820
Paper written while Faraday was still assistant in the Royal Institution,
—See also 787, 2555 bis, 2705, 2762, 2801, 2834, 2849, 2961, 2998, 3089, 3172, 3445.
2550. Electricity. 64 pp. ill. 8vo. *London*, 1820(?)
Cyclopedia article on electricity.
2551. Heat. 64 pp. ill. 8vo. (1820?)
Article taken from an encyclopedia.
2553. Hatchett, (Charles). (1765-1847.) On the electro-magnetic experiments of MM. Oersted and Ampère. (*Philos. Mag.*, Ser. I, Vol. 57, pp. 40-49.) 8vo. *London*, 1821
Condensed account of early electromagnetic experiments.
2554. Kater, Henry. (1777-1835.) On the best kind of steel and form for a compass needle. (*Philos. Trans. Roy. Soc.*, 1821, pp. 104-129.) 4to. *London*, 1821
The Bakerian lecture for the year; the material recommended for compass needles is *clock-spring* and the form that of a *rhombus*.
2555. Barlow, Peter. (1776-1862.) On the anomalous magnetic action of hot iron between white and blood-red heat. (*Philos. Trans. Roy. Soc.*, 1822, pp. 117-126.) 4to. *London*, 1822
It was noticed that there was a temperature at which iron attracted the magnetic needle in the contrary way to which it did when cold—i.e., if the bar and compass were so situated that the N end of the needle was attracted to it when cold, the S end would be drawn to it at the said temperature.
—See also 720, 2563, 2571, 2595, 2617, 2654, 2672.
- 2555bis. Faraday, M(ichael). (1791-1867.) On some new electro-magnetical motions, and on the theory of magnetism. (*Quart. Journ. Sc.*, Vol. xii, pp. 74-96.) 8vo. *London*, 1822
—See also 2549.

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2556. **Harris**, (Sir) W(illiam) S(now). (1792-1867.) Electrical conductors for ships. (Philos. Mag., Ser. I., Vol. 60, pp. 231-233.) 8vo. *London, 1822*
A brief note on lightning-conductors suitable for ships.
—See also 801, 2608, 2637, 2648, 2662, 2682, 2706, 2755, 2767, 2789, 2822, 2862, 2882, 2910, 2915, 3025, 3058, 3094, 3295, 3348, 5139.
2557. **Pasley**, (Sir) Charles W(illiam). (1780-1861.) Practical rules for making telegraphic signals, with a description of the two-armed telegraph invented in 1804. xi+59 pp. 8vo. *London, 1822*
Description of the author's mechanical telegraph.
—See also 2513.
2558. **Sabine**, (Sir) Edward. (1788-1883.) An account of experiments to determine the amount of the dip of the magnetic needle in London, in August 1821, with remarks on the instruments which are usually employed in such determinations. (Philos. Trans. Roy. Soc., 1822, pp. 1-21.) 4to. *London, 1822*
The experiments were made in the course of two voyages in search of a north-west passage in the years 1818 and 1819; ellipticity of the earth's deduced from observations of *g* made with a Kater's pendulum. (See No. 2544.)
—See also 2544.
2559. **Scoresby**, W(illiam). (1789-1857.) Experiments and observations on the development of magnetical properties in steel and iron by percussion. (Philos. Trans. Roy. Soc., 1822, pp. 241-252; 1824, pp. 197-221.) 4to. *London, 1822-1824*
Principal laws governing the development of magnetism in iron by percussion, filing, and bending.
—See also 2545.
2560. **Traill**, Thomas S(teewart). (1781-1862.) Electro-magnetic experiments and observations. (Philos. Trans. Roy. Soc., 1822, pp. 465-480.) 1 plate. 4to. *London, 1822*
Experiments with "right" and "left handed" helices.
—See also 2584, 2686.
2561. **Ampère**, (André Marie). (1775-1836.) Mémoire sur la théorie mathématique des phénomènes électro-dynamiques uniquement déduite de l'expérience. (Mém. de l'Inst., Paris, Vol. VI, pp. 175-387.) 2 plates. 4to. *Paris, 1823*
In this volume, the author works out the mathematical theory of the mutual action of two elements of current.
—See also 762.
2562. **Avogadro**, (Conte de Quaregna), (Amadeo). (1776-1856.) Development of electricity by two pieces of the same metal. (Edinburgh Philos. Journ., Vol. 9, p. 396.) 8vo. *Edinburgh, 1823*
An experiment in thermo-electricity.
2563. **Barlow**, Peter. (1776-1862.) Observations and experiments on the daily variation of the horizontal and dipping needles under a reduced directive power. (Philos. Trans. Roy. Soc., 1823, pp. 326-341.) 1 plate. 4to. *London 1823*
It is suggested that the daily change depends more on the intensity of sunlight than on the temperature of the day.
—See also 2555.

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2564. **Becquerel**, (Antoine César). (1788-1878.) Production of electricity by pressure. (Abstract.) (Edinburgh Philos. Journ., Vol. 9, p. 396.) 8vo.
Edinburgh, 1823
A brief note on static electricity.
—See also 882, 2623, 2657, 2739, 3119, 3280, 3627, 3679, 3715, 3815.
2565. **Christie**, Samuel Hunter. (1784-1865.) On the diurnal deviations of the horizontal needle under the influence of magnets. (Philos. Trans. Roy. Soc., 1823, pp. 342-392.) 2 plates. 4to.
London, 1823
The directive power of the earth was diminished by means of two bar-magnets placed on the line of dip; changes of temperature, a cause of "variation".
—See also 2547.
2566. **Davy**, (Sir) H(umphry). (1778-1829.) On a new phenomenon of electro-magnetism. (Philos. Trans. Roy. Soc., 1823, pp. 153-159.) 4to.
London, 1823
Rotation of vertical conductors conveying a current, when placed in a strong magnetic field.
- 2566a.—(The same paper.) Abstract. (Edinburgh Philos. Journ., Vol. 10, pp. 185-186.) 8vo.
Edinburgh, 1824
—See also 2500.
2567. **Hulls**, Jonathan (also **Hull**). (fl. 1737.) A description and draught of a newly invented machine, for carrying vessels or ships out of or into any harbour, port or river against wind and tide, or in a calm. (Edinburgh Philos. Journ., Vol. 9, pp. 274-278.) 1 plate. 8vo.
Edinburgh, 1823
Description with illustrations of the author's *steamboat*. First published in 1737.
2568. **Pasley**, (Sir) Charles William. (1780-1861.) Observations on nocturnal signals in general, with a simple method of converting Lieut. Colonel Pasley's two-armed telegraph into a universal telegraph for day and night signals. 11+53 pp. 8vo.
Chatham, 1823
Night-signals by means of transparencies.
—See also 2513.
2569. **Pepys**, W(illiam) H(asledine). (1775-1856.) An account of an apparatus on a peculiar construction for performing electro-magnetic experiments. (Philos. Trans. Roy. Soc., 1823, pp. 187-188.) 1 plate. 4to.
London, 1823
The apparatus consisted of plates of copper and zinc rolled round a wooden cylinder and insulated from each other with means for facilitating their immersion in an active liquid.
2570. **Ronalds**, (Sir) (Francis). (1788-1873.) Account of Ronalds' pendulum-doubler of electricity. (Edinburgh Philos. Journ., Vol. 9, pp. 322-325.) 8vo.
Edinburgh, 1823
Device for keeping Ronalds' telegraph wire constantly electrified from a small source of electricity. In 1816 Ronalds sent intelligible messages over eight miles of an insulated air-line by means of the divergence of the pith-balls of an electroscope. (See *Nature*, Nov. 23, 1871.)

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- 2570bis.—Improvements in electrical machines. (Edinburgh Philos. Journ., Vol. 9, pp. 395-396.) 8vo. *Edinburgh, 1823*
 Note on the increased efficiency of the frictional machine when the rubber is kept warm.
 —See also 2534.
2571. Barlow, Peter. (1776-1862.) A popular view of Barlow's magnetical experiments and discoveries, particularly as they have been rendered applicable to the correction of the local attraction of vessels. (Edinburgh Philos. Journ., Vol. 11, pp. 65-87.) 8vo. *Edinburgh, 1824*
 Observations of Capt. Flinders; Barlow's correcting plate. (See No. 765a.)
 —See also 2555.
2572. Cumming, James. (1777-1861.) Table of thermo-electrics. (Edinburgh Philos. Journ., Vol. 11, p. 85.) 8vo. *Edinburgh, 1824*
 —See also 778, 2621.
2573. Davy, (Sir) H(umphry). (1778-1829.) On the corrosion of copper sheathing by sea-water, and on methods of preventing this effect; and on their application to ships of war and other ships. (Philos. Trans. Roy. Soc., 1824, pp. 151-158.) 4to. *London, 1824*
 Zinc and iron recommended for the preservation of copper sheathing.
- 2573a.—Additional experiments and observations on the application of electrical combinations to the preservation of the copper sheathing of ships and to other purposes. (Philos. Trans. Roy. Soc., 1824, pp. 242-246.) 4to. *London, 1824*
 Cast iron is considered to be well adapted for the protection of the copper sheathing of ships.
- 2573b.—Further researches on the preservation of metals by electro-chemical means. (Philos. Trans. Roy. Soc., 1824, pp. 328-346.) 1 plate. 4to. *London, 1825*
 Nails of zinc and iron are recommended.
 —See also 2500.
2574. (Delambre, Jean Baptiste Joseph.) (1749-1822.) Faits nouveaux relatifs à l'aimantation découverte par M. Arago. (Mém. Acad. Sc., Inst. France, Vol. 4, cxlix-clii.) 4to. *Paris, 1824*
 Copper wire conveying a current attracts iron filings; sewing needle magnetized by current; consequent poles.
2575. Doebereiner, (Johann Wolfgang). (1780-1849.) Account of some remarkable and newly discovered properties of the sub-oxide of platina, the oxide of the sulphuret, and the metallic powder of platina. (Philos. Mag., Ser. I, Vol. 63, pp. 153-156.) 8vo. *London, 1824*
 The absorption of hydrogen by platinum and the formation of water or ammonia from oxygen or nitrogen said to be due to a supposed electrochemical element formed by the platinum and the hydrogen.
- 2575bis. Hansteen, (Christopher). (1784-1873.) Remarks made during part of a journey in the summer of 1821. (Edinburgh

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- Philos. Journ., Vol. 10, pp. 207-208.) 8vo. *Edinburgh, 1824*
 Magnetic observations made on a trip from Christiania to Bergen.
 —See also 756, 3450.
2576. **Harvey, G(eorge).** (? -1834.) Experimental inquiries relative to the distribution and changes of the magnetic intensity in ships of war. (Philos. Trans. Roy. Soc., 1824, pp. 310-353.) 5 plates. 4to. *London, 1824*
 Variation in the intensity of magnetic forces in selected brigs and frigates; the intensity was estimated in planes parallel to the decks.
- 2577.—Remarks on the influence of magnetism on the rates of chronometers. (Edinburgh Philos. Journ., Vol. 10, pp. 1-11, 342-346.) 8vo. *Edinburgh, 1824*
 —See also 2609.
2578. **Herschel, (Sir) J(ohn) F(rederick) W(illiam).** (1791-1871.) On certain motions produced in fluid conductors when transmitting the electric current. (Philos. Trans. Roy. Soc., 1824, pp. 162-196.) 4to. *London, 1824*
 The Bakerian lecture; special reference to the bodily motions of small masses of mercury.
- 2578a.—(The same paper.) Abstract. (Annals of Philosophy, Vol. 8, pp. 271-286.) 8vo. *London, 1824*
 —See also 1459, 2594.
2579. **Leslie, John.** (1766-1832.) Observations on electrical theories. (Edinburgh Philos. Journ., Vol. 11, pp. 1-39.) 8vo. *Edinburgh, 1824*
 "Electricity is a state or condition of which every species of matter is susceptible", p. 38.
2580. **Oersted, J(ohannes) C(hristianus).** (1770-1851.) A paradoxical galvanic experiment. (Edinburgh Philos. Journ., Vol. 10, pp. 205-207.) 8vo. *Edinburgh, 1824*
 The author of this note was the famous Professor of natural philosophy in the University of Copenhagen, and discoverer of the magnetic effect of the electric current.
 —See also 773.
2582. **Scoresby, William.** (1789-1857.) Magnetical experiments, designed to illustrate the manner of the existence of the magnetical principle in ferruginous bodies and the mode of its development. (Edinburgh Philos. Journ., Vol. 11, pp. 355-359.) 8vo. *Edinburgh, 1824*
 Results of experiments with a magnetized wire divided into equal parts, showing that the magnetic intensity is greatly increased by placing these magnets end to end as compared with the usual parallel arrangement of compound magnets. From these he concludes that magnetization "simply consists in giving arrangement to the magnetic particles."
 —See also 2545.
2583. **Seguin, (Armand).** (1765(?)-1835.) Observations on the effects of heat and motion. (Edinburgh Philos. Journ., Vol. 10, pp. 280-283.) 8vo. *Edinburgh, 1824*

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2584. **Traill**, Thomas S(tewart). (1781-1862.) On thermo-magnetism. (Edinburgh Philos. Journ., Vol. 11, pp. 258-263.) 8vo. *Edinburgh, 1824*
Thermo-electric currents obtained from pairs of antimony, bismuth and copper; the earth considered as a vast thermo-electric generator.
—See also 2560.
2585. **Wheatstone**, (Sir) Charles. (1802-1875.) Harmonic diagram. (Card.) 8vo. *1824*
Interesting to students of harmony. Early in life, Wheatstone was a manufacturer of musical instruments.
—See also 2183, 2687, 2716, 2812, 3012, 3378, 3427, 3486, 3570, 3573, 3854, 4409, 4460, 4987, 4991, 4993, 4995 bis b, 5018, 5036, 5050.
2586. **Wollaston**, (William Hyde). (1766-1828.) Note on the magnetizing of titanium, cobalt and nickel. (Abstract, Edinburgh Philos. Journ., Vol. 10, pp. 183-184.) 8vo. *Edinburgh, 1824*
- 2587.—On semi-decussation of the optic nerves. (Philos. Trans. Roy. Soc., 1824, pp. 222-231.) 4to. *London, 1824*
Course by which impressions from images are conveyed to the brain; also structure of the optic nerve on which the communication of the impressions depends.
—See also 2501.
2588. **Zuylen van Nyevelt**, P. H. (1783-1825.) Notice respecting some new electro-magnetic phenomena. (Edinburgh Philos. Journ., Vol. 10, pp. 130-138.) 8vo. *Edinburgh, 1824*
Effect of the electric current on the dipping needle.
2589. **Electricity** produced by separation of parts. (Edinburgh Philos. Journ., Vol. 10, p. 185.) 8vo. *Edinburgh, 1824*
Electrical effects due to breaking Prince Rupert's drops, crushing sugar, and tearing cotton cloth.
2590. **Experiments** of Mr. Barlow and Mr. Christie on the diurnal variation of the needle. (Edinburgh Philos. Journ., Vol. 10, pp. 184-185.) 8vo. *Edinburgh, 1824*
Note on the author's paper on the diurnal variation of the needle.
2591. **Popular view** of Mr. Barlow's magnetical experiments and discoveries, particularly as they have been rendered applicable to the correction of the local attraction of vessels. (Edinburgh Philos. Journ., Vol. 11, pp. 65-87.) 8vo. *Edinburgh, 1824*
Extensive treatment of the compass errors arising from the magnetism of the ship.
2592. **Structure** of electric organs of the gymnotus electricus. (Edinburgh Philos. Journ., Vol. 11, p. 221.) 8vo. *Edinburgh, 1824*
A brief note: "If we compare the electric organs of the torpedo and the gymnotus electricus, the first may be compared with the voltaic pile the second with the trough apparatus."
2593. **Tables** of the variation of the magnetic needle in different parts of the globe. (Edinburgh Philos. Journ., Vol. 10, pp. 283-284.) 8vo. *Edinburgh, 1824*
The observations relate to Asia and adjacent islands.

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2594. **Babbage, C(harles)** (1792-1871) & (Sir) **J(ohn) F(rederick) W(illiam) Herschel** (1791-1871). Account of the repetition of M. Arago's experiments on the magnetism manifested by various substances during the act of rotation. (Philos. Trans. Roy. Soc., 1825, pp. 467-496.) 2 plates. 4to. *London, 1825*
Effect of bodies placed as screens between the magnet and the rotating copper disc; time found to be an essential element in magnetic induction.
—See also 2578, 2601.
2595. **Barlow, Peter.** (1776-1862.) On the laws of electro-magnetic action, as depending on the length and dimensions of the conducting wire, and on the question, whether electrical phenomena are due to the transmission of a single or a compound fluid. (Edinburgh Philos. Journ., Vol. 12, pp. 105-114.) 8vo. *Edinburgh, 1825*
Experiments on the conducting power of different wires, with remarks on Franklin's one-fluid theory.
- 2596.—On the temporary magnetic effect induced in iron bodies by rotation. (Philos. Trans. Roy. Soc., 1825, pp. 317-327.) 4to. *London, 1825*
Effect on a compass needle of rotating an iron ball; a 13-inch mortar shell was used.
—See also 2555.
2597. **Christie, Samuel Hunter.** (1784-1865.) On the effects of temperature on the intensity of magnetic forces; and on the diurnal variation of the terrestrial magnetic intensity. (Philos. Trans. Roy. Soc., 1825, pp. 1-65.) 1 plate. 4to. *London, 1825*
Details of numerous experiments made to ascertain the effect of changes of temperature on the strength of magnets; diurnal variations in terrestrial magnetic intensity deduced.
- 2598.—On the magnetism of iron arising from its rotation. (Philos. Trans. Roy. Soc., 1825, pp. 347-417.) 2 plates, 5 tables. 4to. *London, 1825*
Action of a rotating plate of iron on a magnetic needle with description of apparatus and experiments.
- 2599.—On the magnetism developed in copper and other substances during rotation. (Philos. Trans. Roy. Soc., 1825, pp. 497-509.) 4to. *London, 1825*
Experiments made with a horse-shoe magnet suspended over a rotating copper disc.
—See also 2547.
2600. **An account** of the experiment of Barlow of the Royal Military Academy and those of Arago, on the magnetism induced or exhibited in iron, and in other metals, by rotation, with some new experiments on the same subject, by James Marsh. (Edinburgh Philos. Journ., Vol. 13, pp. 119-125.) 8vo. *Edinburgh, 1825*
A heavy iron shell making 720 revolutions per minute was used in the experiments.

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2601. **Babbage, Charles.** (1792-1871.) On electrical and magnetic rotations. (Philos. Trans. Roy. Soc., 1826, pp. 494-528.) 4to.
London, 1826
Importance of the influence of *time* on magnetic phenomena depending on the rotation of some part of the apparatus used.
—See also 2594.
2602. **Biot, J(ean) B(aptiste).** (1774-1862.) Magnetism. (Encyclopaedia Metropolitana, 2nd. edition, pp. 246-280.) 2 plates. 4to.
London, (1826)
—See also 633.
2603. **Christie, Samuel Hunter.** (1784-1865.) On magnetic influence in the solar rays. (Philos. Trans. Roy. Soc., 1826, pp. 219-239+379-396.) 4to.
London, 1826
It is held that solar rays possess magnetic properties independently of the heat which they impart.
—See also 2547.
2604. **Davy, (Sir) H(umphry).** (1778-1829.) On the relations of electrical and chemical changes. (Philos. Trans. Roy. Soc., 1826, pp. 383-422.) 4to.
London, 1826
Historical review of electro-chemical decomposition; chemical changes which take place in a voltaic battery.
—See also 2500.
2605. **Foster, Henry.** (1797-1831.) A comparison of the diurnal changes of intensity in the dipping and horizontal needles at Port Bowen. (Philos. Trans. Roy. Soc., 1826, pp. 177-187.) 4to.
London, 1826
A magnetic needle is mounted (1) as a dipping needle and (2) as a horizontal one; it is then vibrated for the purpose of studying the diurnal change in the terrestrial magnetic intensity.
- 2606.—Account of the repetition of Mr. Christie's experiments on the magnetic properties imparted to an iron plate by rotation, at Port Bowen in May and June, 1825. (With Christie's remarks thereon.) (Philos. Trans. Roy. Soc., 1826, part IV, pp. 188-205.) 4to.
London, 1826
Effect on the compass of rotating an iron plate.
—See also 2629.
2607. **Guillemin, (Amédée).** Magnetism. (Dict. class. d'hist. nat., Vol. 10, pp. 25-30.) 8vo.
Paris, 1826
2608. **Harris, (Sir) William Snow.** (1792-1867.) On the relative powers of various metallic substances as conductors of electricity. (Philos. Trans. Roy. Soc., 1826, pp. 18-24.) 1 plate. 4to.
London, 1826
Relation of the heat evolved to the conductivity of the metal connecting the poles of a battery.
—See also 2556.
2609. **Harvey, George.** (? -1834.) On a remarkable case of magnetic intensity in a chronometer. (Trans. Roy. Soc., Edinburgh, Vol. 10, pp. 117-126.) 4to.
Edinburgh, 1826
Investigation of the magnetic condition of a chronometer and its spring.
—See also 2576.

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2610. **Poisson**, (Siméon Denis). (1781-1840.) *Mémoire sur la théorie du magnétisme en mouvement.* (Mém. Acad. Sc. Paris, Vol. 6, pp. 441-570.) 4to. *Paris, 1826*
Mathematical study of magnetism due to rotation.
—See also 718, 2748.
2611. **Roget**, P(eter) M(ark). (1779-1869.) *Galvanism.* (Encyclopaedia Metropolitana, pp. 173-224.) 1 plate. 4to. *London, 1826*
Extensive discussion of the various theories of galvanism; some powerful voltaic batteries.
—See also 871.
2612. **Savary**, (Savart) F(élix). (1797-1841.) *Mémoire sur l'aimantation.* (Ann. Chim. et Phys., Vol. 31, pp. 5-57.) 8vo. *Paris, 1826*
Strength of magnets, nature of magnetism.
—See also 804.
2613. **Somerville**, (Mrs.) M(ary) Fairfax. (1780-1872.) *On the magnetizing power of the more refrangible solar rays.* (Philos. Trans. Roy. Soc., 1826, part II, pp. 132-139.) 4to. *London, 1826*
Supposed magnetic effect of the *violet* rays of sunlight.
—See also 890.
2614. **Electricity.** (Encyclopaedia Metropolitana, 2nd edition, pp. 41-172.) 5 plates. 4to. *London, 1826*
2615. **Electro-magnetism.** (Quarterly Review, Vol. 35, pp. 237-269.) 8vo. *London, 1826*
General exposition of facts; Ampère's experiments and theory.
2616. **On the noises that sometimes accompany the aurora borealis.** (Edinburgh New Philos. Journ., Vol. 1, pp. 156-159.) 8vo. *Edinburgh, 1826*
Musschenbroek, Nairne and Cavallo are quoted as having heard peculiar noises during auroral displays.
2617. **Barlow**, Peter. (1776-1862.) *Account of the observations and experiments made on the diurnal variation and intensity of the magnetic needle by Captain Parry, Lieutenant Foster, and Lieutenant Ross, in Captain Parry's Third Voyage, with remarks and illustrations.* (Edinburgh New Philos. Journ., Vol. 2, pp. 347-365.) 1 plate. 8vo. *Edinburgh, 1827*
These interesting observations were made from December 1824 to May 1825.
- 2618.—*On the secondary deflections produced in a magnetized needle by an iron shell, in consequence of an unequal distribution of magnetism in its two branches.* (Philos. Trans. Roy. Soc., 1827, pp. 276-285.) 4to. *London, 1827*
Experiments made with a 13-inch mortar-shell which could be raised or lowered and a compass-needle which could be carried about it in a circle.
—See also 2555.
2619. **Christie**, S(amuel) H(unter). (1784-1865.) *On the mutual action of the particles of magnetic bodies, and on the law of*

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- variation of the magnetic forces generated at different distances during rotation. (Philos. Trans. Roy. Soc., 1827, pp. 71-121.) 1 plate. 4to. *London, 1827*
Experiments made with a flat copper ring suspended over the poles of a revolving horse-shoe magnet.
- 2620.—Theory of the diurnal variation of the magnetic needle. (Philos. Trans. Roy. Soc., 1827, pp. 308-354.) 1 table. 4to. *London, 1827*
Thermo-electric experiments made with a compound ring of bismuth and copper; application to terrestrial magnetism.
—See also 2547.
2621. Cumming, J(ames). (1777-1861.) On the development of electromagnetism by heat. (Trans. Cambridge Philos. Soc., Vol. 2, pp. 47-75.) 4to. *Cambridge, 1827*
Short account of the author's researches in *thermo-electricity*.
—See also 2572.
2622. Electricity. Part I. (Library of Useful Knowledge, No. 15.) 32 pp. ill. 8vo. *London, 1827*
2623. Becquerel, (Antoine César). (1788-1878.) On the electrical phenomena caused by the rubbing of metals with each other. (Edinburgh New Philos. Journ., Vol. 6, pp. 133-184.) 8vo. *Edinburgh, 1828*
List of metals examined and arranged so that each one is negative to those that follow it.
- 2624.—Relations between electricity and heat. (Edinburgh New Philos. Journ., Vol. 5, pp. 188-189.) 8vo. *Edinburgh, 1828*
Note on electrification produced by heating glass, gum-lac, tourmaline.
—See also 2564.
2625. Christie, S(amuel) H(unter). (1784-1865.) On the laws of the deviation of magnetized needles towards iron. (Philos. Trans. Roy. Soc., 1828, pp. 325-360.) 4to. *London, 1828*
Action of a mass of iron on the horizontal and the dipping needle; mathematical theory.
—See also 2547.
2626. Dalton, John. (1766-1844.) On the height of the aurora borealis above the surface of the earth; particularly the one seen on the 29th of March, 1826. (Philos. Trans. Roy. Soc., 1828, pp. 291-302.) 1 plate. 4to. *London, 1828*
The author of this paper was the celebrated chemist and founder of the modern atomic theory.
—See also 582, 2722.
2627. De la Rive, Aug(uste Arthur). (1801-1873.) Recherches sur la cause de l'électricité voltaïque. (Mém. Soc. Phys. et d'Hist. Nat. Genève, Vol. 4, pp. 285-334.) 4to. *Geneva, 1828*
- 2627a.—(English translation.) (Philos. Mag., Ser. II, Vol. 11, pp. 274-299.) 8vo. *London, 1837*
The author defends the chemical theory of the voltaic cell.
—See also 818, 2860, 3085, 3285, 3392, 3441, 3537.

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2628. **Ermann, G(eorg) A(dolph).** (1806-1877.) Essai sur la direction et l'intensité de la force magnétique à St. Petersburg. (Mém. Sav. Etrang. Acad. Sc. St. Petersburg, Vol. 1, pp. 97-129.) 4to. St. Petersburg, 1828
—See also 3698.
2629. **Foster, Henry.** (1797-1831.) A comparison of the changes of magnetic intensity throughout the day in the dipping and horizontal needles at Treurenburgh Bay in Spitzbergen. (Philos. Trans. Roy. Soc., 1828, pp. 303-311.) 4to. London, 1828
The needles were vibrated at different times of the day to determine to what extent each was affected.
—See also 2605.
2630. **Kemp, K(enneth) T.** (1806?-1843.) On a new galvanic trough. (Edinburgh New Philos. Journ., Vol. 5, pp. 80-75.) 8vo. Edinburgh, 1828
The elements of this battery are pure mercury and an amalgam of mercury and zinc.
—See also 2638.
2631. **Richardson, John.** (1787-1865.) On the aurora borealis. (Edinburgh New Philos. Journ., Vol. 5, pp. 241-243.) 8vo. Edinburgh, 1828
Height of the aurora; general appearance; gold-leaf electroscope not affected. The observations were made continuously for a period of six months in a high latitude.
2632. **Ritchie, W(illiam).** (? -1837.) Experiments and observations on electrical conduction. (Philos. Trans. Roy. Soc., 1828, pp. 373-387.) 4to. London, 1828
Conductivity of rarefied gases, heated vapors, hot and cold iron.
—See also 2641, 2669, 2677.
2633. **Sabine, (Sir) Edward.** (1788-1883.) Experiments to ascertain the ratio of the magnetic forces acting on a needle suspended horizontally in Paris and in London. (Philos. Trans. Roy. Soc., 1828, pp. 1-14.) 4to. London, 1828
The determinations were made at Chiswick (London) and Paris, cylindrical magnets suspended by a silk fibre being employed.
—See also 2544.
2634. **On electricity.** (Scientific Irrigator, 1828, pp. 282-475.) 12mo. Edinburgh, 1828
2635. **Motions of the magnetic equator.** (Abstract of paper by M. Morellet.) (Edinburgh New Philos. Journ., Vol. 5, pp. 190-191.) 8vo. Edinburgh, 1828
Note on M. Morellet's memoir on the position of the magnetic equator.
2636. **Farquharson, James.** (1781-1843.) On a definitive arrangement, and order of the appearance and progress of the Aurora Borealis; and on its height above the surface of the earth. (Philos. Trans. Roy. Soc., 1829, pp. 103-125.) 4to. London, 1829
—See also 2646, 2753.

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- 2637. Harris, (Sir) William Snow.** (1792-1867.) Experimental inquiries concerning the laws of magnetic forces. (Trans. Roy. Soc., Edinburgh, Vol. 11, pp. 277-321.) 3 plates. 4to. *Edinburgh, 1829*
Description of an instrument by means of which the author studied the fundamental laws of magnetic phenomena.
—See also 2556.
- 2638. Kemp, K(enneth) T.** ((1806?-1843.) Description of an improved blowpipe.—On the ascent of mercury on wires of iron.—Experiments on the electromagnetic properties of carbon when in a state of combustion. (Edinburgh New Philos. Journ., Vol. 6, pp. 340-344.) 8vo. *London, 1829*
Carbon while undergoing "combustion" is a good electrical conductor.
—See also 2630.
- 2639. Moser, Ludwig (Ferdinand) (1805-1880) & Peter (Theophil) Riess (1804-1883).** Ueber den Einfluss der Waerme auf den Magnetismus. (Ann. Phys. u. Chem., Vol. 93, pp. 403-434.) 8vo. *Berlin, 1829*
Temperature coefficient of magnets.
—See also 2696, 3250.
- 2640. Pohl, G(eorg) F(riedrich).** (1788-1849.) Der Prozess der galvanischen Kette. (Jahrbuecher f. Wissensch. Kritik, 1829, pp. 110-272.) 4to. *Berlin, 1829*
Reactions in the voltaic battery: theory.
—See also 825.
- 2641. Ritchie, W(illiam).** (? -1837.) An experimental examination of the electric and chemical theories of galvanism. (Philos. Trans. Roy. Soc., 1829, pp. 361-366.) 4to. *London, 1829*
Weak points of Volta's contact theory; argument in favor of a modified chemical theory.
—See also 2632.
- 2642. Sabine, (Sir) Edward.** (1788-1883.) On the dip of the magnetic needle in London in August 1828. (Philos. Trans. Roy. Soc., 1829, pp. 47-53.) 1 plate. 4to. *London, 1829*
The determination was made at Chiswick (London) with a needle specially constructed to avoid errors arising from non-coincidence of the centres of gravity and suspension.
—See also 2544.
- 2643. Watt, Mark.** Description of a new instrument (proposed to be named a magnetometer) for measuring the different degrees of magnetic intensity that are exhibited during the day, throughout the year, and at various parts of the globe. (Edinburgh New Philos. Journ., Vol. 6, pp. 376-379.) 8vo. *Edinburgh, 1829*
The instrument consisted of two small pivoted magnets with similar poles opposite each other.

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- 2644.—Notice of an experiment which proves that the magnetic needle does not point North and South; but only when it is suspended in a position approaching to the horizontal, or so that it cannot show its natural bearings. (Edinburgh New Philos. Journ., Vol. 6, pp. 379-382.) 8vo.

Edinburgh, 1829

The author thinks that there are grounds for believing that the sun, the moon and planets exert a magnetic effect.

2645. **Magnetism.** (Encyclopaedia Metropolitana, pp. 735-847.) 4to.

London, 1829

An extract from Cavallo's "Treatise on Magnetism" is given in the article, containing a reference to the letter of *Petrus Peregrinus*, p. 737. (See No. 46, 235, 540.)

2646. **Farquharson, James.** (1781-1843.) Experiments on the influence of the Aurora Borealis on the magnetic needle. (Philos. Trans. Roy. Soc., 1830, pp. 97-115.) 4to. *London, 1830*

Matters connected with the physics of the aurora borealis are incidentally treated.

—See also 2636.

2647. **Fox, Robert Were.** (1789-1877.) On the electro-magnetic properties of metalliferous veins in the mines of Cornwall. (Philos. Trans. Roy. Soc., 1830, pp. 399-414.) 4to. *London, 1830*

Electrical currents due to mineral veins and internal heat.

—See also 2661, 2694, 2740, 2763.

2648. **Harris, (Sir) William S(now).** (1792-1867.) On the utility of fixing lightning conductors on ships. 23 pp. 1 plate. 8vo.

Plymouth, 1830

Nature of a thunder-storm; numerous instances of ships being struck by lightning.

- 2648a.—(The same paper.) (Edinburgh New Philos. Journ., Vol. 11, pp. 154-167+305-316.) 8vo. *Edinburgh, 1831*

—See also 2556.

2649. **Quetelet, (Lambert) Adolphe Jacques.** (1796-1874.) Recherches sur l'intensité magnétique de différens lieux de l'Allemagne et des Pays-Bas. (Mém. Acad. Sc., Belgique, Vol. 6.) 18 pp. 4to. *Brussels, 1830*

Supplement to the work of Hansteen and Sabine (see No. 756, 945), magnetic observations made in Germany and the Netherlands.

- 2650.—Recherches sur l'intensité magnétique en Suisse et en Italie. (Mém. Acad. Sc., Belgique, Vol. 6.) 16 pp. 4to.

Brussels, 1830

Instrument for observing directly the total magnetic force; also its advantages.

—See also 968, 2761, 2905, 2922.

2651. **Riess, P(eter Theophil) (1804-1883) & (Ludwig Ferdinand) Moser** (1805-1880). Ueber die taegliche Veraenderung der magnetischen Kraft und weitere Ausfuehrung der Poisson'-

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schen Methode, die Intensitaet des Erdmagnetismus zu messen. (Ann. Phys. u. Chem., Vol. 95, pp. 161-179.) 8vo.

Berlin, 1830

Hourly variation of the total intensity of the earth's magnetic force.

—See also 2696, 3250.

2652. **Galvanism.** (Edinburgh Encyclopaedia, Vol. 10, pp. 79-102.) 4to. *Edinburgh, 1830*

2653. **Telegraph.** (Edinburgh Encyclopaedia, Vol. 18, pt. 2, 533-539.) 2 plates. 4to. *Edinburgh, 1830*

The paper relates to mechanical telegraphs only.

2654. **Barlow, Peter.** (1776-1862.) On the probable electric origin of all the phenomena of terrestrial magnetism. (Philos. Trans. Roy. Soc., 1831, pp. 41-50+99-108.) 4to. *London, 1831*

The laws of terrestrial magnetism are inconsistent with those of a permanent magnetic body, but are coincident with those of a body in a transient state of magnetic induction; the author's terrella of 1824 representing all the phenomena of terrestrial magnetism.

2655.—On the errors in the course of vessels, occasioned by local attraction; with some remarks on the recent loss of His Majesty's ship *Thetis*. (Philos. Trans. Roy. Soc., 1831, pp. 215-221.) 4to. *London, 1831*

Rules concerning the amount and direction of the deflecting force due to the iron masses of ships.

2655a.—Sur l'attraction locale des vaisseaux. Traduit par M. Coulier. (Bull. Soc. Geogr., Ser. I, 1831, pp. 205-211.) 8vo.

Paris, 1831

Extracts from the author's paper on the "deviation" of the compass. (See No. 765a.)

—See also 2555.

2656. **Barry, Alexander.** (? -1832.) On the chemical action of atmospheric electricity. (Philos. Trans. Roy. Soc., 1831, pp. 165-166.) 4to. *London, 1831*

Experiment made with atmospheric electricity obtained by means of a kite, Aug. 1824.

2657. **Becquerel, (Antoine César).** (1788-1878.) Mémoire sur le pouvoir thermo-électrique des métaux. (Mém. Acad. Sc. Paris, Vol. 10, pp. 237-258+271-285.) 4to. *Paris, 1831*

Theory and development of thermo-electric currents.

2658.—Mémoire sur les sulfures, iodures, bromures, etc. métalliques. (Mém. Acad. Sc., Paris, Vol. 10, pp. 259-270.) 4to.

Paris, 1831

Chemical paper on metallic sulphides.

2659.—Mémoire sur un procédé électro-chimique pour retirer le manganèse et le plomb des dissolutions dans lesquelles ils se trouvent. (Mém. Acad. Sc. Paris, Vol. 10, pp. 286-292.) 4to.

Paris, 1831

Brief note describing the author's method for extracting manganese and lead from solutions.

—See also 2564.

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2660. **Davy, Edmund.** (1785-1857.) On a simple electro-chemical method of ascertaining the presence of different metals; applied to detect minute quantities of metallic poisons. (Philos. Trans. Roy. Soc., 1831, pp. 147-164.) 4to. *London, 1831*
In electrolytic decomposition, the author recognizes that the metals are attracted by negatively electrified metallic surfaces and repelled by positively electrified surfaces with forces sufficiently energetic to overcome chemical affinity.
2661. **Fox, Robert Were.** (1789-1877.) On the variable intensity of terrestrial magnetism and the influence of the Aurora Borealis upon it. (Philos. Trans. Roy. Soc., 1831, pp. 199-207.) 4to. *London, 1831*
"It is evident that the elevation of the aurora must often be exceedingly great, probably much more than a thousand miles."
—See also 2647.
2662. **Harris, (Sir) W(illiam) S(now).** (1792-1867.) On the transient magnetic state of which various substances are susceptible. (Philos. Trans. Roy. Soc., 1831, pp. 67-90.) 2 plates. 4to. *London, 1831*
Every kind of matter is considered to be more or less susceptible of a state of transient magnetism, arising from induction; remarks on Barlow's observation that a hollow sphere of iron exerts the same influence on a compass-needle as if it were a solid mass.
- 2663.—On the influence of screens in arresting the progress of magnetic action. (Philos. Trans. Roy. Soc., 1831, pp. 497-500.) 1 plate. 4to. *London, 1831*
Magnetic screening possesses great scientific interest and "if fully investigated is not unlikely to make us further acquainted with one of the agencies on which the phenomena of attraction may depend."
- 2664.—On the power of masses of iron to control the attractive force of a magnet. (Philos. Trans. Roy. Soc., 1831, pp. 501-506.) 1 plate. 4to. *London, 1831*
Some experiments on magnetic screening.
—See also 2556.
2665. **On the influence of lightning conductors on vegetation.** (Edinburgh New Philos. Journ., Vol. 11, pp. 386-388.) 8vo. *Edinburgh, 1831*
Experiments showing that plants do not grow more vigorously near a lightning-conductor.
2666. **Davy, John.** (1790-1868.) An account of some experiments and observations on the torpedo. (Philos. Trans. Roy. Soc., 1832, pp. 259-278.) 4to. *London, 1832*
Experiments on the magnetizing, heating and chemical effects of the electricity of the torpedo, with remarks on the electrical organs of the fish; Walsh's experiments of 1772.
—See also 2679, 2693, 3170.
2667. **Henry, Joseph.** (1797-1878.) On a disturbance of the earth's magnetism, in connection with the appearance of an aurora

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borealis, as observed at Albany, April 19th, 1831. (N. Y. Senate Papers, 1831, pp. 107-119.) 8vo. *Albany, 1832*
 The aurora was visible in Europe; determination of the magnetic disturbance in England by Christie, p. 115.
 —See also 1002, 2724, 2756, 2917, 2937, 3135.

2668. **Papen, A.** Topographischer Atlas des Koenigreiches Hannover und Herzogthums Braunschweig. 80 maps. 46x33 cm. *Hanover, 1832-1847*
 Sectional topographical map of Hanover, Germany, with dedication by George V., King of Hanover, to Mr. Clark.

2669. **Ritchie, William.** (? -1837.) Experimental researches in voltaic electricity and electro-magnetism. (Philos. Trans. Roy. Soc., 1832, pp. 279-298.) 1 plate. 4to. *London, 1832*
 Theory and laws of the action of the voltaic battery.
 —See also 2632.

2670. **Scoresby, William.** (1789-1857.) On the uniform permeability of all known substances to the magnetic influence, and the application of the fact in engineering and mining, for the determination of the thickness of solid substances not otherwise measurable. (Edinburgh New Philos. Journ., Vol. 13, pp. 97-132.) 8vo. *Edinburgh, 1832*
 Law of distance and its application to the determination of the thickness of a wall or mass of rock.
 —See also 2545.

2671. **Arago, (Dominique François Jean).** (1786-1853.) Éloge historique d'Alexandre Volta. (Mém. Acad. Sc. Paris, Vol. 12 (Hist.), pp. 58-104.) 4to. *Paris, 1833*
 In this panegyric of Volta, reference is made to Franklin's kite, evaporation and atmospheric electricity; electricity due to contact; the electrophorus and the voltaic battery, "the most marvelous instrument created by the mind of man".
 2671a.—(English translation.) Historical stage of Alexander Volta. (Edinburgh New Philos. Journ., Vol. 16, pp. 1-33.) 8vo. *London, 1834*
 —See also 915, 2751.

2672. **Barlow, Peter.** (1776-1862.) On the present situation of the magnetic lines of equal variation, and their changes on the terrestrial surface. (Philos. Trans. Roy. Soc., 1833, pp. 667-673.) 2 plates. 4to. *London, 1833*
 Isogonic lines with map; the first mention of magnetic "variation" attributed (erroneously) to *Petrus Peregrinus*, A. D. 1269; in 1660 the line of no variation crossed the Atlantic nearly at right angles to the meridians; the author wrote the article on *Magnetism* in the *Encyclopaedia Metropolitana*.
 —See also 2555.

2673. **Christie, S(amuel) H(unter).** (1784-1865.) Experimental determination of the laws of magneto-electric induction. (Philos. Trans. Roy. Soc., 1833, pp. 95-142.) 2 plates. 4to. *London, 1833*
 The Bakerian Lecture, 1833; the object of the research was to determine

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whether the "magnetic" currents excited in different metals were, under similar circumstances, of equal strength.

- 2674.—On improvements in the instruments and methods employed in determining the direction and intensity of the terrestrial magnetic force. (Philos. Trans. Roy. Soc., 1833, pp. 343-358.) 4to. *London, 1833*
Means of eliminating errors in making determinations of magnetic dip.
—See also 2547.
2675. Fisher, George. (1794-1873.) Magnetical experiments made principally in the south part of Europe and in Asia Minor, during the years 1827-1832. (Philos. Trans. Roy. Soc., 1833, pp. 237-252.) 4to. *London, 1833*
Magnetic dip at Malta, 1829; influence of altitude on dip.
2676. Higgins, William M(ullinger) & J(ohn) W(illiams) Draper. Remarks on electrical decompositions. (Edinburgh New Philos. Journ., Vol. 14, pp. 314-316.) 8vo. *Edinburgh, 1833*
General remarks on the decomposition of substances by the passage of the electric current.
—See also 722.
2677. Ritchie, W(illiam). (? -1837.) Experimental researches in electro-magnetism and magneto-electricity. (Philos. Trans. Roy. Soc., 1833, pp. 313-321.) 1 plate. 4to. *London, 1833*
Experiments with revolving electromagnets.
—See also 2632.
2678. Watkins, Francis. On the magnetic powers of soft iron. (Philos. Trans. Roy. Soc., 1833, pp. 333-342.) 4to. *London, 1833*
Residual magnetism of soft-iron bars and horse-shoes; Arago's method of making steel-magnets.
—See also 847.
2679. Davy, John. (1790-1868.) Observations on the torpedo, with an account of some additional experiments on its electricity. (Philos. Trans. Roy. Soc., 1834, pp. 531-550.) 4to. *London, 1834*
Nature of the electrical discharge of the torpedo, the author was Sir Humphry Davy's brother.
—See also 2666.
2680. Forbes, James D(avid). (1809-1868.) Account of some experiments in which an electric spark was elicited from a natural magnet. (Trans. Roy. Soc., Edinburgh, Vol. 12, pp. 197-205.) 1 plate. 4to. *Edinburgh, 1834*
The "natural" magnet used was capable of supporting a weight of 170 lbs.
—See also 2723, 2835, 3127, 3233, 3573.
2681. Hancock, J. On the cause of the appearance commonly termed heat-lightning, and on certain correlative phaenomena. (Philos. Mag.) (Extract) 7 pp. 8vo. *London, 1834*
"Heat" lightning as witnessed in Demerara, British Guiana.
2682. Harris, (Sir) William Snow. (1792-1867.) On a new electrometer, and the heat excited in metallic bodies by voltaic electricity. (Trans. Roy. Soc., Edinburgh, Vol. 13, pp. 206-221.) 1 plate. 4to. *Edinburgh, 1834*
This is a modified form of air-thermometer.

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- 2683.—On some elementary laws of electricity. (Philos. Trans. Roy. Soc., 1834, pp. 213-245.) 3 plates. 4to. London, 1834
The author's "unit" jar; his views on electrical separation; effect of heat on electrical conductivity.
- 2683a.—Inquiries concerning the elementary laws of electricity. (Second series.) (Philos. Trans. Roy. Soc., 1836, pp. 417-452.) 2 plates. 4to. London, 1836
The author's bifilar balance; comparison of electrical capacities.
- 2683b.—(The same paper.) (Third series.) (Philos. Trans. Roy. Soc., 1836, pp. 215-242.) 2 plates. 4to. London, 1839
The author's "hydrostatic electrometer;" the charge of a pane-condenser varies directly as the coated area and inversely as the thickness of the glass. (Cavendish.)
—See also 2556.
2684. Peltier, J(ean) C(harles) A(thanase). (1785-1845.) Nouvelles expériences sur la calorité des courants électriques. (Ann. Chim. et Phys., Vol. 56, pp. 371-386.) 1 plate. 8vo. Paris, 1834
Heat developed in conductors by the electric current.
—See also 944, 2697, 2713, 2747, 2760, 2807, 2826.
2685. Ross, (Sir) James Clark. (1800-1862.) On the position of the north magnetic pole. (Philos. Trans. Roy. Soc., 1834, pp. 47-52.) 4to. London, 1834
Observations locating the magnetic pole in *Boothia Felix*, place called after Mr. Felix Booth who furnished the means for equipping the expedition.
—See also 2710.
2686. Traill, (Thomas Stewart). (1781-1862.) Experiments on magnetic intensity made at Liverpool and Manchester. (Edinburgh New Philos. Journ., Vol. 17, pp. 197-198.) 8vo. Edinburgh, 1834
The experiments show that Hansteen estimated the magnetic intensity of England a little too high.
—See also 2560.
2687. Wheatstone, (Sir) Charles. (1802-1875.) An account of some experiments to measure the velocity of electricity and the duration of electric light. (Philos. Trans. Roy. Soc., 1834, pp. 583-591.) 2 plates. 4to. London, 1834
Details of the determination made with the revolving mirror, spark-balls and resistance giving as a result for the *velocity of electricity* a value greater than that of light, *viz.* 288,000 miles per second.
—See also 2585.
2688. "γμ" Electro-magnetic experiments. (Edinburgh New Philos. Journ., Vol. 16, pp. 71-75.) 8vo. Edinburgh, 1834
Experiments on the development of magnetism in an electro-magnet by varying the arrangement of the cells in the battery.
2689. Instructions for observers of the aurora borealis. (Distributed by the British Association for the Advancement of Science.) (Edinburgh New Philos. Journ., Vol. 16, pp. 33-38.) 8vo. Edinburgh, 1834

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2690. **On telegraphers, horse and foot for field service.** (Reviewed in Westminster Review, Vol. 21, pp. 211-212.) 8vo.
London, 1834
System of flag-signaling. Original work in French and in Greek.
2691. **Connell, Arthur.** (1794-1863.) On the action of voltaic electricity on alcohol, ether, and aqueous solutions. (Edinburgh New Philos. Journ., Vol. 19, pp. 159-163.) 8vo. *Edinburgh, 1835*
Remarks on Faraday's electrolytic law of definite proportions.
—See also 2721.
2692. **Davies, Thomas Stephens.** (1794 (?)—1851.) Geometrical investigations concerning the phenomena of terrestrial magnetism. (Philos. Trans. Roy. Soc., 1835, pp. 221-248.) 4to.
London, 1835
Mathematical consequences of the theory of two magnetic poles situated arbitrarily within the earth.
- 2692a.—(The same paper.) Second Series: On the number of points at which a magnetic needle can take a position vertical to the earth's surface. (Philos. Trans. Roy. Soc., 1836, pp. 75-106.) 4to.
London, 1836
The author's conclusion is that when two centres of magnetic force of equal intensity and opposite direction are situated anywhere within the earth, there are always two, and never more than two points on its surface at which the needle can take a direction perpendicular to the horizon.
2693. **Davy, John.** (1790-1868.) Remarks on certain statements of Faraday, contained in the fourth and fifth series of his "Experimental researches in electricity." (Edinburgh New Philos. Journ., Vol. 19, pp. 317-325.) 8vo. *Edinburgh, 1835*
Controversial paper in which the author defends his brother (Sir Humphry Davy) against some criticisms made by Faraday. (See No. 2705.)
—See also 2666.
2694. **Fox, R(ober) W(ere).** (1789-1877.) On the absence of magnetism in cast iron when in fusion. (Report, British Ass. Adv. Sc., 1835, Pt. II, p. 33.) 8vo. *London, 1835*
Argument tending to favor the agency of electricity in producing terrestrial magnetism; a note.
- 2695.—Note on the electrical relations of certain metals and metaliferous minerals. (Philos. Trans. Roy. Soc., 1835, pp. 39-40.) 4to.
London, 1835
List of metals and minerals arranged according to their place in the electrical scale.
—See also 2647.
2696. **Moser, Ludwig (Ferdinand).** (1805-1880.) Ueber den Magnetismus der Erde. (Ann. Phys. und Chem., Vol. 34, pp. 271-292.) 8vo. *Berlin, 1835*
Terrestrial magnetism with discussion of some formulæ used in magnetic determinations.
—See also 942, 2639, 2651, 2791, 2805.

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2697. **Peltier**, (Jean Charles Athanase.) (1785-1845.) Expériences électro-magnétiques. (Ann. de Chim. et Phys., Vol. 60, pp. 261-271.) 8vo. *Paris, 1835*
Criticism on the two-fluid and molecular-current theories in magnetism.
—See also 2684.
2698. **Sabine**, (Sir) Edward. (1788-1883.) Report on the phenomena of terrestrial magnetism, being an abstract of the "Magnetismus der Erde" of Prof. Ch. Hansteen. (Report, British Ass. Adv. Sc., 1835, pp. 61-90.) 2 plates. 8vo. *London, 1835*
Hansteen's results discussed in the light of the author's own observations; maps of *isomagnetic* lines. (See No. 756.)
—See also 2544.
2699. **Velocity** of electricity. (Edinburgh New Philos. Journ., Vol. 19, pp. 179-181.) 8vo. *Edinburgh, 1835*
Notice of Wheatstone's experiment with the spark-discharge and rotating mirror which gave for the velocity of electrical transmission 288,000 miles per second.
2700. **Bache**, A(lexander) D(allas). (1806-1867.) On the relative horizontal intensities of terrestrial magnetism at several places in the United States, with the investigation of corrections for temperature, and comparisons of the methods of oscillations in full and in rarefied air. (Trans. Amer. Philos. Soc., N. S., Vol. 5, pp. 427-457.) 4to. *Philadelphia, 1836*
Magnetic determinations made between 1834-1836.
—See also 1436, 3334.
2701. **Barker**, William. On electric currents passing through platinum wire. (Notices of Communications to the British Ass. Adv. Sc. 1835, p. 33.) 8vo. *London, 1836*
Parts of the platinum wire observed to be dark in comparison with others that were white hot.
2702. **Christie**, Charles C. Memoranda made during the appearance of the aurora borealis on the 18th of November, 1835. (Philos. Trans. Roy. Soc., 1836, pp. 31-34.) 2 plates. 4to. *London, 1836*
2703. **Christie**, S(amuel) H(unter). (1784-1865.) Discussion of the magnetical observations made by Captain Back, during his late Arctic expedition. (Philos. Trans. Roy. Soc., 1836, pp. 377-415.) 4to. *London, 1836*
Observations on magnetic dip with some theoretical results; position of the north magnetic pole.
—See also 2547.
2704. **Daniell**, J(ohn) Frederic. (1709-1845.) On voltaic combinations in (six) letters addressed to Michael Faraday. (Philos. Trans. Roy. Soc., 1836, pp. 107-129; 1837, pp. 119-139, 1 plate; 1838, pp. 41-56, 1 plate; 1839, pp. 89-95; 1842, pp. 137-155, ill.) 4to. *London, 1836-1842*
The author's battery; defense of the chemical theory of the voltaic cell. (Two of the papers contain the author's autograph.)
—See also 828, 2752, 4989.

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2705. **Faraday**, (Michael). (1791-1867.) Reply to John Davy's remarks on certain statements by Faraday, contained in his "Researches on electricity." (Edinburgh New Philos. Journ., Vol. 20, pp. 37-42.) 8vo. *Edinburgh, 1836*
Sir Humphry Davy and the law of electrolytic conduction. Reference to a regrettable controversy. (See No. 2693.)
—See also 2549.
2706. **Harris**, (Sir) W(illiam) S(now). (1792-1867.) On a species of balance and its application to the measurement of electrical repulsion. (Report, British Ass. Adv. Sc., 1835, p. 17.) 8vo. *London, 1836*
The needle of the instrument is suspended by two parallel torsionless threads; a note.
- 2707.—On electrical attraction. (Report, British Ass. Adv. Sc., 1835, pp. 17-18.) 8vo. *London, 1836*
Remarks on the law of the inverse square of the distance; cases in which it does not hold; a note.
- 2708.—On the investigation of magnetic intensity by the oscillations of the horizontal needle. (Trans. Roy. Soc., Edinburgh, Vol. 13, pp. 1-26.) 3 plates. 4to. *Edinburgh, 1836*
The mechanical conditions of the magnet, mode of suspension, temperature, disturbing influence of the air, studied experimentally; practical deductions.
—See also 2556.
2709. **Johnson**, Edward J(ohn). (? -1853.) Report of magnetic experiments tried on board an iron steam-vessel. (Philos. Trans. Roy. Soc., 1836, pp. 267-288.) 1 plate. 4to. *London, 1836*
Practical observations on placing compasses on board steam-vessels generally.
—See also 1116.
2710. **Lloyd**, Humphrey (1800-1881), (Sir) Edward **Sabine** (1788-1883) & (Sir) J(ames) C(lark) **Ross** (1800-1862). Observations on the direction and intensity of the terrestrial magnetic force in Ireland. (Report, British Adv. Sc., 1835, pp. 117-162.) 1 map. 8vo. *London, 1836*
—See also 1023, 2544, 2685, 2726.
2711. **M'Gauley**, James William. (? -1867.) An inquiry into the possibility and advantage of the application of magnetism as a moving power, with remarks on the nature of magnetism. (Notices, British Ass. Adv. Sc., 1835, pp. 20-24.) 8vo. *London, 1836*
2712. **Mallet**, Robert. (1810-1881.) On an economic application of electro-magnetic forces to manufacturing purposes. (Notices, British Ass. Adv. Sc., 1835, pp. 18-19.) 8vo. *London, 1836*
Magnetic separation of iron from copper filings.
—See also 2837.
2713. **Peltier**, J(ean) C(harles) A(thanase). (1785-1845.) Observations sur quelques causes d'erreur dans les mesures des tensions électriques et description d'un nouvel électromètre. (Ann. Chim. et Phys., Vol. 62, pp. 422-432.) 1 plate. 8vo. *Paris, 1836*
Remarks on Henley's "electrometer" and Coulomb's torsion balance.
—See also 2684.

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2714. Ross, (Sir) John. (1777-1856.) On the aurora borealis. (Notices, British Ass. Adv. Sc., 1835, p. 18.) 8vo. *London, 1836*
The aurora borealis is said to take place within the cloudy regions of the earth's atmosphere.
—See also 897.
2715. Sabine, (Sir) Edward. (1788-1883.) Observations on the direction and intensity of the terrestrial magnetic force in Scotland. (Report, British Ass. Adv. Sc., Vol. 6, pp. 97-119.) 1 plate. 8vo. *London, 1836*
This magnetic survey of Scotland was made in 1836.
—See also 2544.
2716. Wheatstone, (Sir) (Charles). (1802-1875.) On the prismatic decomposition of electrical light. (Notices, British Ass. Adv. Sc., 1835, pp. 11-12.) 8vo. *London, 1836*
Spark-spectrum obtained by using mercury, zinc, cadmium and bismuth electrodes; Fraunhofer lines.
- 2717.—On the various attempts which have been made to imitate human speech by mechanical means. (Notices, British Ass. Adv. Sc., 1835, p. 14.) 8vo. *London, 1836*
Note on Hempler's talking-machine.
—See also 2585.
2718. Report of the Astronomer Royal of the Royal Observatory at Greenwich to the Board of Visitors for 1836, 1852, 1855-1892. 2 vols. Sq. folio. *Greenwich, 1836-1892*
The magnetic constants annually determined at Greenwich.
2719. Bird, Golding. (1814-1854.) Observations on the electrochemical influence of long-continued electric currents of low tension. (Philos. Trans. Roy. Soc., 1837, pp. 37-45.) 1 plate. 4to. *London, 1837*
Slight modification of Prof. Daniell's newly invented battery in order to adapt it to electrochemical work.
—See also 1140.
2720. Christie, S(amuel) Hunter (1784-1865) & (Sir) G(eorge) B(iddell) Airy. (1801-1892.) Report upon a letter addressed by M. le baron de Humboldt to His Royal Highness the President of the Royal Society. (Edinburgh New Philos. Journ., Vol. 22, pp. 316-330.) 8vo. *Edinburgh, 1837*
Report on terrestrial magnetism.
—See also 2547, 2750.
2721. Connell, Arthur. (1794-1863.) On the action of voltaic electricity on pyroxylic spirit, and solutions in water, alcohol, and ether. (Philos. Trans. Roy. Soc., Vol. 14, Pt. I, pp. 110-136.) 4to. *London, 1837*
Electrolytic decomposition of alcohol and chemical nature of the changes produced; secondary actions.
- 2721a.—Farther researches on the voltaic decomposition of aqueous and alcoholic solutions. (Philos. Trans. Roy. Soc., Vol. 15, Pt. I, pp. 151-163.) 4to. *London, 1841*
Law limiting the direct action of the current to the solvent.
—See also 2691.

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2722. Dalton, John. (1766-1844.) Sequel to an essay on the constitution of the atmosphere, published in the Philosophical Transactions for 1826; with some account of the sulphurets of lime. (Philos. Trans. Roy. Soc., 1837, pp. 347-363.) 4to.
London, 1837
Quantity of oxygen in air taken at different altitudes.
—See also 2626.
2723. Forbes, James D(avid). (1809-1868.) Account of some experiments made in different parts of Europe on terrestrial magnetic intensity. (Trans. Roy. Soc., Edinburgh, Vol. 14, pp. 1-29.) 1 map. 4to. *Edinburgh, 1837*
General account of the variations of the earth's magnetic intensity together with determinations of the same made with Hansteen's apparatus in different parts of Europe.
- 2723a.—Account of some additional experiments on terrestrial magnetism. (Trans. Roy. Soc., Edinburgh, Vol. 15, pp. 27-36.) 4to. *Edinburgh, 1840*
Observations of dip and total force in some towns in Germany and also in the Swiss Alps.
—See also 2680.
2724. Henry, Joseph. (1797-1878.) Contributions to electricity and magnetism. I. Description of a galvanic battery for producing electricity of different intensities. (Trans. Amer. Philos. Soc., N. S., Vol. 5, pp. 217-222.) 4to. *Philadelphia, 1837*
Some of Henry's induction experiments with flat coils.
- 2725.—(The same paper.) II. On the influence of a spiral conductor in increasing the intensity of electricity from a galvanic arrangement of a single pair. (Trans. Amer. Philos. Soc., N. S., Vol. 5, pp. 223-231.) 4to. *Philadelphia, 1837*
- 2725a.—(The same paper.) (Philos. Mag., Ser. III, Vol. 16, pp. 257-265.) ill. 8vo. *London, 1840*
—See also 2667.
2726. Lloyd, H(umphrey). (1800-1881.) An attempt to facilitate observations of terrestrial magnetism. (Trans. Irish Academy, Vol. 17, pp. 159-170.) 4to. *Dublin, 1837*
The author shows how the dip and force may be measured directly by a single instrument. (Autograph copy).
- 2726a.—Further development of a method of observing the dip and the magnetic intensity at the same time. (Trans. Irish Academy, Vol. 17, pp. 449-460.) 4to. *Dublin, 1837*
Results obtained by the author's method for the direction and intensity of magnetic force in Dublin during the year 1834.
—See also 2710, 2769, 2790, 2823, 2883, 3004, 3099, 3238, 3458.
2727. McConnell, Benjamin Rush. Notice of a revolving electro-magnetic instrument. (Amer. Journ. Sc. and Arts, Vol. 33, pp. 188-190.) 8vo. *New Haven, 1837*
This electro-magnetic engine has points in common with the one devised by Sturgeon in 1828.

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2728. **Matteucci, Carlo.** (1811-1868.) Sur la propagation du courant électrique dans les liquides. (Ann. Chim. et Phys., Ser. II, Vol. 66, pp. 225-313.) 8vo. *Paris, 1837*
Remarks on the nature of electrification and the electric current.
—See also 985, 2770, 2779, 2839, 2851, 2867, 2903, 2919, 2939, 3067, 3193, 3244, 3304, 3461.
2729. **Page, Charles Grafton.** (1812-1868.) Method of increasing shocks, and experiments with Prof. Henry's apparatus for obtaining sparks and shocks from the calorimotor. (Amer. Journ. Sc. & Arts, Vol. 31, pp. 137-141.) 8vo. *New Haven, 1837*
- 2730.—On the use of the dynamic multiplier, with a new accompanying apparatus. (Amer. Journ. Sc. & Arts, Vol. 32, pp. 354-360.) 8vo. *New Haven, 1837*
—See also 1651, 2742, 2758, 5112.
2731. **Pollock, Thomas.** The action of the voltaic battery shown to be two-fold, and the distinction between the terms quantity and intensity determined by the theory of vibration. (Trans. London Electr. Soc., 1837, pp. 1-9.) 1 plate. 4to. *London, 1837*
The writer seeks to show that the true cause of the electric and the chemical action of the current is the difference of the "electromotive power" of solid bodies for the same fluid.
—See also 870.
2732. **Schoenbein, C(hristian) F(riedrich).** (1799-1868.) Experimental researches on a peculiar action of iron upon solutions of some metallic salts. (Philos. Mag., Vol. 10, pp. 267-274.) 8vo. *London, 1837*
It is held that the electric current is due to chemical action and not to the mere contact of dissimilar metals.
—See also 989, 2749, 2794, 2943.
2733. **Simonoff, (Ivan Michailowitch).** (1785-1855.) Sur le magnétisme terrestre. (Journ. Mathémat., Crelle, Vol. 16, pp. 197-205.) 4to. *Berlin, 1837*
Biot's theory in terrestrial magnetism of a short, central magnet discussed.
2734. **Traill, William.** St. Elmo's fire seen in Orkney. (Edinburgh New Philos. Journ., Vol. 23, p. 220.) 8vo. *Edinburgh, 1837*
Note descriptive of the phenomenon which was vivid but of short duration.
2735. **Davenport's** electro-magnetic machine. (Amer. Journ. Sc. & Arts, Vol. 33, p. 193.) 8vo. *New Haven, 1837*
Brief notice of the apparatus without diagram.
2736. **Morse's** electro-magnetic telegraph. (Amer. Journ. Sc. & Arts, Vol. 33, pp. 185-187.) 8vo. *New Haven, 1837*
The distinguishing features of the system; specimen of the Morse code.
2737. **The Penny cyclopedia** of the Society for the diffusion of useful knowledge. Vol. 9 (Dio—Erne). L. 8vo. *London, 1837*
Articles on *electricity, electrometer and electro-dynamics.*

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2738. **Andrews, Thomas.** (1813-1885.) On the properties of voltaic circles in which concentrated sulphuric acid is the liquid conductor. (Trans. Irish Academy, Vol. 18, pp. 149-156.) 4to. *Dublin, 1838*
Experiments bearing on the zinc in voltaic batteries.
—See also 3163.
2739. **Becquerel, (Antoine César).** (1788-1878.) Observations on the electric origin of metalliferous veins. (Edinburgh New Philos. Journ., Vol. 25, pp. 167-173.) 8vo. *Edinburgh, 1838*
"It appears almost certain that veins have not all been produced by one general cause, and that many influences have sometimes concurred in their formation."
—See also 2564.
2740. **Fox, R(ober) W(ere).** (1789-1877.) On the lamination of clay by electricity. (Edinburgh New Philos. Journ., Vol. 25, pp. 196-198.) 8vo. *Edinburgh, 1838*
The author shows how this laminated state may be imitated electrically.
—See also 2647.
2741. **Héricart de (Thury), (Louis Etienne François).** (1776-1854.) De l'influence des arbres sur la foudre et ses effets et considérations à ce sujet. (Extrait, Ann. de l'Agricult. Franç., 1838.) 27 pp. 8vo. *Paris, 1838*
Protective power of trees recognized; description of trees struck by lightning.
2742. **Page, Charles G(rafton).** (1812-1868.) Electro-magnetic apparatus and experiments. (Amer. Journ. Sc. & Arts, Vol. 33, pp. 190-192.) ill. 8vo. *New Haven, 1838*
Rotation of conductors conveying currents, without the use of mercury.
- 2743.—Experiments in electro-magnetism. (Amer. Journ. Sc. & Arts, Vol. 33, pp. 118-120.) 8vo. *New Haven, 1838*
Galvanic music; electromagnetism as a moving power.
- 2744.—New magnetic electrical machine of great power with two parallel horse-shoe magnets, and two straight rotating armatures, affording each, in an entire revolution, a constant current in the same direction. (Amer. Jour. Sc. & Arts, Vol. 34, pp. 163-169.) 8vo. *New Haven, 1838*
- 2745.—Rotatory multiplier, or astatic galvanometer. (Amer. Journ. Sc. & Arts, Vol. 33, pp. 376-379.) 8vo. *New Haven, 1838*
- 2746.—Researches in magnetic electricity and new magnetic electrical instruments. (Amer. Journ. Sc. & Arts, Vol. 34, pp. 364-373.) 8vo. *New Haven, 1838*
—See also 2729.
2747. **Peltier, J(ean) C(harles) A(thanase).** (1785-1845.) Une note sur la force électro-motrice du contact, en opposition à la manière de voir émise récemment sur cette question par M. Fechner et par M. Péclet dans la troisième édition de son Traité de physique. ("L'Institut" No. 258, 1838, 4 pp.) 8vo. *Paris, 1838*
Statement and defense of the author's views on contact electricity.
—See also 2684.

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2748. **Poisson**, (Siméon Denis). (1781-1840.) *Mémoire sur les déviations de la boussole, produites par le fer des vaisseaux.* (Mém. Acad. Sc., Paris, Vol. 16, pp. 479-555.) 4to. *Paris, 1838*
Noteworthy paper of the French mathematician on magnetic theory.
—See also 2610.
2749. **Schoenbein**, C(hristian) F(riedrich). (1799-1868.) *Beobachtungen ueber das elektro-motorische Verhalten einiger Metall-hyperoxyde, des Platins und des passiven Eisens.* (Ann. Phys. und Chem., Vol. 43, pp. 89-104.) 8vo. *Berlin, 1838*
Note on the *passive state* of iron.
—See also 2732.
2750. **Airy**, (Sir) G(eorge) B(iddell). (1801-1892.) *Account of experiments on iron-built ships, instituted for the purpose of discovering a correction for the deviation of the compass produced by the iron of the ships.* (Philos. Trans. Roy. Soc., 1839, pp. 167-213.) 4to. *London, 1839*
The experiments show the great intensity of permanent magnetism of malleable iron; every plate of rolled iron was found to be strongly magnetic.
—See also 1376, 2720, 2993, 3017, 3047, 3077, 3277, 3332, 3381, 3574, 3595, 3626, 3678, 3713, 4255.
2751. **Arago**, (Dominique François Jean). (1786-1853.) *On thunder and lightning.* (Edinburgh New Philos. Journ., Vol. 26, pp. 81-144+275-291.) 8vo. *Edinburgh, 1839*
This is one of Arago's famous memoirs; the various kinds of lightning; thunder-tubes; danger to powder-magazines; protection of life and property; the ringing of bells and firing of guns during a storm.
—See also 2671.
2752. **Daniell**, J(ohn) Frederic. (1790-1845.) *On the electrolysis of secondary compounds in (two) letters addressed to Michael Faraday.* (Philos. Trans. Roy. Soc., 1839, pp. 97-112, ill.; 1840, pp. 209-224, 2 plates.) 4to. *London, 1839-1840*
Electrical decomposition of sodium sulphate, sulphate of ammonia and binary compounds.
- 2752a. —Additional researches. (Philos. Trans. Roy. Soc., 1844, pp. 1-20.) 4to. *London, 1844*
—See also 2704.
2753. **Farquharson**, James. (1781-1843.) *Report of a geometrical measurement of the height of the Aurora Borealis above the earth.* (Philos. Trans. Roy. Soc., 1839, pp. 267-280.) 4to. *London, 1839*
The calculation gives a little less than one mile as the greatest height of a particular aurora borealis.
—See also 2636.
2754. **Hare**, R(obert). (1781-1858.) *Engraving and description of a rotatory multiplier, or one in which one or more needles are made to revolve by a galvanic current.* (Trans. Amer. Philos. Soc., N. S., Vol. 6, pp. 343-345.) 4to. *Philadelphia, 1839*
Electro-magnetic motor: continuous rotation obtained by a timely interruption of the current in the surrounding coil.
—See also 2766, 2778.

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2755. **Harris, (Sir) W(illiam) S(now).** (1792-1867.) Brief history of two hundred and twenty ships of the Royal Navy of Great Britain, struck and damaged by lightning. (pp. 39-61.) 8vo. *London, (1839?)*
The conclusion is: "Equip the ships with lightning conductors".
—See also 2556.
2756. **Henry, Joseph.** (1797-1878.) Contributions to electricity and magnetism. III. On electro-dynamic induction. (Trans. Amer. Philos. Soc., N. S., Vol. 6, pp. 303-337.) 4to. *Philadelphia, 1839*
Induced currents of different orders; induction effects due to Leyden jar discharge.
—See also 2667.
2757. **Martens, (Martin).** (1797-1863.) Mémoire sur la pile galvanique et sur la manière dont elle opère les décompositions des corps. (Mém. Acad. Sc., Belgique, Vol. 12, pp. 1-47.) 4to. *Brussels, 1839*
Theory of the voltaic cell and of electrolytic decomposition.
—See also 2838.
2758. **Page, Charles Grafton.** (1812-1868.) Magneto-electric and electro-magnetic apparatus and experiments. (Amer. Journ. Sc. & Arts, Vol. 35, pp. 252-268.) 8vo. *New Haven, 1839*
- 2759.—On electro-magnetism as a moving power. (Amer. Journ. Sc. & Arts, Vol. 35, pp. 106-113.) 8vo. *New Haven, 1839*
—See also 2729.
2760. **Peltier, (Jean Charles Athanase).** (1785-1845.) Mémoire sur la formation des tables des rapports qu'il y a entre la force d'un courant électrique et la déviation des aiguilles des multiplicateurs. (Ann. Chim. et Phys., Ser. II, Vol. 71, pp. 225-313.) 8vo. *Paris, 1839*
Electricity of contact and its measurement; remarks on laws of thermo-electric currents.
—See also 2684.
2761. **Quetelet, (Lambert) A(dolphe Jacques).** (1796-1874.) Sur l'état du magnétisme terrestre à Bruxelles, pendant les douze années de 1827 à 1839. 40 pp. 4to. *Brussels, 1839*
Magnetic dip and declination at Brussels for the period 1827-1839 followed by discussion of observations.
—See also 2649.
2762. **Faraday, Michael.** (1791-1867.) Experimental researches in electricity. Sixteenth and Seventeenth Series. 24. On the source of power in the voltaic pile. (Philos. Trans. Roy. Soc., 1840, pp. 61-127.) 1 plate. 4to. *London, 1840*
Contact electromotive force.
—See also 2549.
2763. **Fox, Robert Were.** (1789-1877.) Some remarks on electric currents in metalliferous veins. (Edinburgh New Philos. Journ., Vol. 28, pp. 267-270.) 8vo. *Edinburgh, 1840*
Experiments made by the author in mines which indicate a general tendency in the electric currents to take a westerly direction in veins in-

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clining towards the north, but an easterly one in veins dipping towards the south.

—See also 2647.

2764. **Gibbs, Oliver W**(olcott). A description of a new form of magneto-electric machine, and an account of a carbon battery of considerable energy. (Amer. Journ. Sc. & Arts, Vol. 39, pp. 132-134.) 8vo. *New Haven, 1840*
Brass disc centered on bar of iron which is wound on one end with 400 feet of wire and at the other end with four times that quantity of finer wire. One extremity of the coarse wire goes to the battery, the other extremity connects with the other electrode through a make-and-break contact. Currents are induced in the fine-wire coil.
2765. **Haldat du Lys, (Charles Nicolas Alexandre).** (1770-1852.) *Recherches sur les causes de l'extinction du son.* (Mém. Soc. Sc., Nancy, 1840, pp. 88-101.) 8vo. *Nancy, 1840*
The paper takes into consideration the influence of solid, liquid and gaseous bodies in extinguishing sound.
—See also 979.
2766. **Hare, Robert.** (1781-1858.) A letter to Prof. Faraday, on certain theoretical opinions. (Amer. Journ. Sc. & Arts, Vol. 38, pp. 1-11.) 8vo. *New Haven, 1840*
Considerations on the nature of positive and negative electricity. Dr. Hare was Professor of Chemistry in the University of Pennsylvania; he devised the apparatus known as Hare's *Deflagrator*.
—See also 2754.
2767. **Harris, (Sir) W**(illiam) **Snow.** (1792-1867.) On lightning conductors, and the effects of lightning on Her Majesty's Ship *Rodney* and certain other ships of the British Navy: being a further examination of Sturgeon's memoir on marine lightning conductors. (Philos. Mag., Ser. III, Vol. 16, pp. 117-128.) 1 plate. 8vo. *London, 1840*
General character and effect of the electric discharge.
—See also 2556.
2768. **Hunt, Robert.** (1807-1887.) Experiments and observations on light which has permeated coloured media, and on the chemical action of the solar spectrum. (Philos. Mag., Ser. III, Vol. 16, pp. 267-275.) 8vo. *London, 1840*
—See also 1099.
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Special reference is made to the position of magnets in magnetic observatories: a mathematical paper.
—See also 2726.
2770. **Matteucci, Carlo.** (1811-1868.) Sur l'action chimique du courant voltaïque. (V. mémoire.) (Bibliothèque Univers., Genève, Vol. 26, pp. 380-390.) 8vo. *Geneva, 1840*
—See also 2728.

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The laws which these currents seem to follow are deduced from numerous experimental observations.
- 2772. Sabine, (Sir) Edward.** (1788-1883.) Contributions to terrestrial magnetism No. I. Lines of inclination and intensity in the Atlantic Ocean II. Lines of intensity between the Cape of Good Hope and Australia. (Philos. Trans. Roy. Soc., 1840, pp. 129-155.) 2 plates. 4to. *London, 1840*
Observations of magnetic intensity and dip made by Lieut. Sullivan in a voyage across the Atlantic 1838-1839.
—See also 2544.
- 2773. Description d'un nécessaire électrodynamique ou d'un appareil construit par MM. Breton frères et à l'aide du quel on peut répéter facilement les expériences fondamentales de Volta, d'Oersted, d'Ampère, de Nobili, de Faraday, de Ritchie, etc. relatives aux propriétés physiques, chimiques et dynamiques des courants électriques.** 14 pp. 4to. *Paris, (1840?)*
Brief description with diagrams of such electro-dynamical apparatus as Ampère's stand, Barlow's wheel, solenoids etc.
- 2774. Abria, (Jérémie Joseph Benoit).** (1811-1892.) Recherches sur l'aimantation par les courants. (Ann. Chim. et Phys., Ser. III, Vol. I, pp. 385-439.) 8vo. *Paris, 1841*
—See also 1245, 3275.
- 2775. Bravais, A(uguste) (1811-1863) & C(harles Frédéric) Martins (1806-1889).** Comparaisons barométriques faites à Bruxelles et dans le nord de l'Europe. (Mém. Acad. Sc., Bruxelles, Vol. 14, pp. 31-78.) 4to. *Brussels, 1841*
Short description of the barometers of various well-known observatories.
—See also 1245, 3275.
- 2776. Duperrey, (Louis Isidore).** (1786-1865.) Extrait d'une lettre, au sujet des observations sur les intensités relatives du magnétisme terrestre à Paris et à Bruxelles. (Bull. Acad. Sc., Bruxelles, Vol. 8, No. 7, pp. 1-6.) 8vo. *Brussels, 1841*
- 2777. Goldschmidt, (C. W.) B.** Results of the daily observations of magnetic declination during six years at Goettingen. (Translation.) (Taylor's Scientific Memoirs, Ser. I, Vol. 2, pp. 589-600.) 8vo. *London, 1841*
Discussion of the daily magnetic observations made during the years 1834-1840.
- 2778. Hare, Robert.** (1781-1858.) On the extrication of the alkali-fiable metals, barium, strontium, and calcium. (Amer. Philos. Soc., N. S., Vol. 7, pp. 31-41.) 4to. *Philadelphia, 1841*
An electrolytic process is described.
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—See also 2728.
2781. (**Palmer, W.**) Electrotypes; a brief description of the art of working in metal by voltaic electricity. 20 pp. 12mo.
London, 1841
2782. **Poggendorff, J(ohann) C(hristian).** (1796-1877.) Methode zur quantitativen Bestimmung der elektromotorischen Kraft inconstanter galvanischer Ketten. (Ann. Phys. und Chem., Vol. 54, pp. 161-191.) 8vo. *Leipzig, 1841*
This is the author's *compensation method* of comparing the electromotive force of cells.
- 2782a.—(The same paper.) (Verh. Akad. Wiss., Berlin, 1841, pp. 263-294.) 8vo. *Berlin, 1841*
- 2783.—Ueber die Frage, ob es wirksame galvanische Ketten ohne primitive chemische Action gebe, und ueber die Bildung der Eisensaure auf galvanischem Wege. (Ann. Phys. und Chem., Vol. 54, pp. 353-377.) 8vo. *Leipzig, 1841*
The c. m. f. of a platinum-iron couple; also chemical theory of the voltaic cell.
- 2783a.—(The same paper.) (Verh. Akad. Wiss., Berlin, 1841, pp. 312-324.) 8vo. * *Berlin, 1841*
—See also 1027, 2792, 2842, 3410, 3610.
2784. **Sabine, (Sir) Edward.** (1788-1883.) Contributions to terrestrial magnetism. No. III. Captain Belcher's observations on the west coast of America and the adjacent islands. IV. New determination of the magnetic elements at Otaheite. (Philos. Trans. Roy. Soc., 1841, pp. 11-35.) 4to. *London, 1841*
Magnetic observations made by Captain Belcher on the West Coast of America, 1837-1840; the magnetic elements at Otaheite, April 1840.
—See also 2544.
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—See also 1110, 3270.
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- of Good Hope and Kerguelen Island. (Philos. Trans. Roy. Soc., 1842, pp. 9-41.) 1 plate. 4to. *London, 1842*
 Observations of magnetic intensity made by the officers of Her Majesty's ships *Erebus* and *Terror*, 1839-1840.
 —See also 2544.
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 Table of the dielectric constant of glass, pitch, sulphur, and wax, air being taken as unity.
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 —See also 2726.
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 —See also 2696.
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 Note on a method of comparing the current strength of two batteries.
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 An improved voltmeter.
 —See also 2782.
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 Influence of the nature of the electrodes on decompositions effected by the electric current.
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 Some effects of the electric current.

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Beacons, semaphores and mechanical telegraphs.
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Numerous experiments with thermo-electric batteries made for the purpose of testing the view that heat may be regarded as a compound of latent heat and electricity.
—See also 2817, 2857.
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* The Problem is the name of a yacht built for speed, stability and weatherly qualities.
—See also 5516.
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—See also 2549.
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Various forms of the author's gas battery; effects produced; experiments bearing on the theory of its action.
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List of gases which may be used as excitants in Grove's gas battery.
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 —See also 2544.
- 2810. Silliman, B(enjamin, jr.)** (1816-1885.) Description of a carbon voltaic battery. (Amer. Journ. Sc. & Arts, Vol. 44, pp. 180-186.) ill. 8vo.
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conductor of the respective discharges. (Proc. London Electr. Soc., 1843, Vol. I, pp. 465-504.) ill. L. 8vo. *London, 1843*
 Much interesting matter on the nature of the Leyden jar discharge which the author believes to be essentially different from a flash of lightning. (Autograph copy).

—See also 1007, 3156, 3269, 3328, 3474, 3850, 4050, 4382, 4706, 5185, 5411.

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—See also 2585.

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The Peltier effect; experiments with his cross.

—See also 2798.

2818. **Barry**, Emile (Louis François). (1799- ?.) Statique appliquée au magnétisme; note sur la manière de corriger le défaut de centrage des boussoles d'inclination. (Nouvelles Ann. Math., Vol. 3, pp. 257-264.) 1 plate. 8vo. *Paris, 1844*

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—See also 2544.

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—See also 2728.
2852. Sabine, (Sir) E(dward). (1788-1883.) Contributions to terrestrial magnetism: containing a magnetic survey of a considerable portion of the North American continent. (Philos. Trans. Roy. Soc., 1846, pp. 237-336.) 4to. *London, 1846*
- 2853.—(The same paper): containing a magnetic survey of the southern hemisphere between the meridians of 0° and 125° East, and parallels of 20° and 70°. (Philos. Trans. Roy. Soc., 1846, pp. 337-432.) 5 plates. 4to. *London, 1846*
—See also 2544.
2854. Wall, A. On the formation of aeroliths in connection with electricity. 4 pp. 8vo. *London, 1846*
Some electrical phenomena attending volcanic eruptions.
—See also 5509.
2855. Wilson, George. (1818-1859.) On the applicability of the electro-magnetic bell. (Edinburgh New Philos. Journ., Vol. 40, pp. 310-312.) 8vo. *Edinburgh, 1846*
Experiments on the transmission of sound by elastic fluids. (Autograph copy, dedicated to Prof. Buff.)
—See also 1244, 2968.
2856. Review of experimental researches in electricity. Nineteenth, twentieth and twenty-first series: On magnetic phenomena by Michael Faraday. (Quarterly Review, Vol. 79, pp. 93-126.) 8vo. *London, 1846*
Comment on Faraday's views on the rotation of the plane of polarization by a magnetic field. (See No. 2849.)
2857. Adie, Richard. (1810-1880.) An account of experiments with galvanic couples immersed in pure water and in oxygenated water. (Philos. Mag., Ser. III, Vol. 31, pp. 350-356.) 8vo. *London, 1847*
A simple cell consisting of zinc, copper and "pure" water, though hermetically sealed, is found to give a slight current.
—See also 2798.

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2858. Brooke, Charles. (1804-1879.) On the automatic registration of magnetometers, and other meteorological instruments by photography. (Philos. Trans. Roy. Soc., 1847, pp. 59-78, 5 plates; 1850, pp. 83-92; 1852, pp. 19-24, 1 plate.) 4to.
London, 1847-1852
 Description of the artificial light and photographic paper used; use of the barometer and thermometer for automatic records; temperature-coefficients of the magnets employed; automatic temperature compensation of the force-magnetometers.
 —See also 1667, 3493.
2859. Callan, N(icholas) J. On a new voltaic battery, cheap in its construction and use, and more powerful than any battery yet made, and on a cheap substitute for the nitric acid of Grove's platina battery. (Philos. Mag., Ser. III, Vol. 31, pp. 81-85.) 8vo.
London, 1847
 The author's *cast-iron battery*; Father Callan was Professor of Natural Philosophy in Maynooth College, Ireland.
 —See also 2880, 2997, 3121, 3335.
2860. De la Rive, Auguste (Arthur). (1801-1873.) Researches on the voltaic arc, and on the influence which magnetism exerts both on this arc and on bodies transmitting interrupted electric currents. (Philos. Mag., Ser. III, Vol. 30, pp. 321-335.) 8vo.
London, 1847
 General phenomena of the arc; influence of the electrodes and of a magnetic field; acoustical phenomena.
 —See also 2627.
2861. Grove, (Sir) W(illiam) R(obert). (1811-1896.) On certain phenomena of voltaic ignition and the decomposition of water into its constituent gases by heat. (Philos. Trans. Roy. Soc., 1847, pp. 1-22.) 1 plate. 4to.
London, 1847
 Remarks on the theory of Grotthus; the spheroidal state; decomposition of water by white-hot platinum.
 —See also 2802.
2863. Harris, (Sir) W(illiam) Snow. (1792-1867.) Three remarkable examples of the operation of capacious metallic conductors permanently fixed throughout the masts and hull in the defending ships *Fishgard*, *Scylla*, and *Dido* from the destructive agency of lightning. 16 pp. 2 plates. 8vo.
London, 1847
 Examples of ships preserved in thunderstorms by means of lightning-conductors.
 —See also 2556.
2863. Hatcher, W(illiam) H(enry). Account of the electric telegraph now in use for railways and other purposes. 20 pp. ill. 12mo.
London, 1847
 —See also 1115, 5001.
2864. Kolbe, (Adolph Wilhelm) H(ermann). (1818-1884.) On the decomposition of valerianic acid by the voltaic current. (Philos. Mag., Ser. III, Vol. 31, pp. 348-350.) 8vo.
London, 1847
 Preliminary notice of observed changes.

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2865. **Lefroy**, (Sir) J(ohn) H(enry). (1817-1890.) Letter to Lieut.-Colonel Sabine on a great magnetic disturbance on the 24th of September 1847. (Philos. Mag., Ser. III, Vol. 31, pp. 346-347.) 8vo. *London, 1847*
The observed disturbance in declination is given at S. $4^{\circ} 2'$.
—See also 2965.
2866. **Loomis**, Elias. (1811-1889.) Letter to Lieut.-Colonel Sabine, on the determination of differences of longitude made in the United States by means of the electric telegraph, and on projected observations for investigating the laws of the great North American storms. (Philos. Mag., Ser. III, Vol. 31, pp. 338-341.) 8vo. *London, 1847*
Difference of longitude between New York, Philadelphia and Washington determined by the electric telegraph.
—See also 1365, 3100, 3190, 3301, 3459, 3643.
2867. **Matteucci**, Carlo. (1811-1868.) Electro-physiological researches. 4th memoir. The physiological action of the electric current. (Philos. Trans. Roy. Soc., 1847, pp. 483-499.) 4to. *London, 1847*
The electric discharge traversing a nerve awakens muscular contraction and produces a variation in the excitability of the nerve.
- 2868.—(The same paper.) 5th Series, Part I. Upon induced contractions. Part II. On the phenomena elicited by the passage of the current through the nerves of a living animal, or of an animal recently killed, according to the direction of the current. (Philos. Trans. Roy. Soc., 1847, pp. 231-237.) 4to. *London, 1847*
Connection between nervous influence and the passage of the electric current according to the direction of the latter.
- 2869.—(The same paper.) 6th Series. Laws of the electric discharge of the torpedo and other electric fishes; theory of the production of electricity in these animals. (Philos. Trans. Roy. Soc., 1847, pp. 239-241.) 4to. *London, 1847*
- 2870.—(The same paper.) 7th Series. Upon the relation between the intensity of the electric current, and that of the corresponding physiological effect. (Philos. Trans. Roy. Soc., 1847, pp. 243-248.) 1 plate. 4to. *London, 1847*
Experiments showing that the electro-physiological effect is proportional to the intensity of the current.
—See also 2728.
2871. **Matthiessen**, Adolphe. Détermination expérimentale du pouvoir rotateur, par influence magnétique, d'un grand nombre de composés transparents. (Comptes rendus, Acad. Sc., Paris, Vol. 24, pp. 969-973.) 4to. *Paris, 1847*
Experiments bearing on the magnetic rotation of the plane of polarization. (Autograph copy).

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- 2871a.**—Étude des effets rotateurs produits par les poles d'un électro-aimant sur les solides transparents. (Deuxième Mémoire.) (Comptes rendus, Acad. Sc., Paris, Vol. 25, pp. 20-24.) 4to. Paris, 1847
(Autograph copy).
- 2871b.**—Liste des composés vitrifiés qui produisent une rotation du plan de polarisation, plus forte que le verre pesant de Faraday. (Comptes rendus, Acad. Sc., Paris, Vol. 25, pp. 172-175.) 4to. Paris, 1847
(Autograph copy.)
- 2872.** Norton, William A(ugustus). (1810-1883.) On terrestrial magnetism. (Amer. Journ. Sc. & Arts, Ser. II, Vol. 4, pp. 1-12+207-230.) 8vo. New Haven, 1847
The author develops a theory of terrestrial magnetism founded on the distribution of heat over the globe.
—See also 3407.
- 2873.** Ronalds, (Sir) Francis. (1788-1873.) On photographic self-registering meteorological and magnetical instruments. (Philos. Trans. Roy. Soc., 1847, pp. 111-117.) 2 plates. 4to. London, 1847
The self-registering instruments referred to are the barometrograph, thermograph, declination-magnetograph and electrograph.
—See also 2534.
- 2874.** Sabine, (Sir) Edward. (1788-1883.) On the diurnal variation of the magnetic declination at St. Helena. (Philos. Trans. Roy. Soc., 1847, pp. 51-57.) 2 plates. 4to. London, 1847
These magnetic observations cover the period 1841-1845.
—See also 2544.
- 2875.** Solly, E(dward). (1819-1886.) On the applications of electricity to practical purpose. (Pharmac. Journ. Trans., Vol. 6, pp. 400-412.) ill. 4to. London, 1847
Remarks on Strada's *Prolusiones* (see No. 90), on Ronalds, Steinheil, and Henry.
—See also 1107.
- 2876.** Zantedeschi, (Francesco). (1797-1873.) On the motions presented by flame when under electro-magnetic influence. (Philos. Mag., Ser. III, Vol. 31, pp. 421-424.) 8vo. London, 1847
Experiments made by the author in continuation of Padre Bancalari's discovery of the repulsion of flames by a strong magnetic field.
- 2877.** Brett and Little's electric inventions. (Chambers' Edinburgh Journ., 1847, pp. 305-307.) 4to. Edinburgh, 1847
Description of the "Electro-magnetic conserver," and other telegraphic inventions.
- 2878.** Explanation of the construction and method of working the needle telegraph. 16 pp. ill. pl. 16mo. Brentwood, (1847)

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2879. **Handbook** to the electric telegraph; being a popular explanatory treatise on the construction, nature, and powers, of this wonder-working instrument, with a full account of its origin and progress; also a drawing and explanation of the electric clock. Second edition. 27 pp. ill. pl. 12mo. *London, 1847*
The telegraph mileage in England and in the United States for the time.
2880. **Callan, Nicholas J.** On the construction and power of a new form of galvanic battery. (*Philos. Mag., Ser. III, Vol. 33, pp. 49-53.*) 8vo. *London, 1848*
Description of the author's *cast-iron battery*.
—See also 2859.
2881. **Goodman, John.** On a new and practical voltaic battery of the highest powers, in which potassium forms the positive element. (*Philos. Mag., Ser. III, Vol. 33, pp. 207-211.*) 8vo. *London, 1848*
The author's battery illustrated by experiments; reference to Gassiot's water-battery of 3,500 cells.
—See also 2962.
2882. **Harris, (Sir) W(illiam) Snow.** (1792-1867.) Instructions for the application of permanently fixed conductors of lightning to Her Majesty's ships. 19 pp. ill. 6 plates. 8vo. *London, 1848*
The description is illustrated by colored plates.
—See also 2556.
2883. **Lloyd, Humphrey.** (1800-1881.) An account of a method of determining the total intensity of the earth's magnetic force in absolute measure. (*Philos. Mag., Ser. III, Vol. 33, pp. 212-217.*) 8vo. *London, 1848*
- 2883a.—(The same paper.) Abstract. (*Proc. Irish. Acad., Vol. 4, pp. 57-63.*) 8vo. *Dublin, 1848*
- 2884.—Circular for the information of the directors of the British Colonial Magnetical Observatories. 7 pp. 8vo. *Dublin, 1848*
The circular contains the theory of the induction magnetometer.
- 2885.—On the corrections required in the measurement of magnetic declination. (*Proc. Irish Acad., Vol. 4, pp. 219-229.*) 8vo. *Dublin, 1848*
The error arising from the torsion of the suspension thread is taken into account. (Autograph copy, dedicated to Prof. Challis.)
—See also 2726.
2886. (**Morgan and Barber.**) The aurora borealis of October 24, 1847. 20 pp. 12 colored plates. 8vo. (*Cambridge, 1848?*)
Detailed account of the aurora as seen at Cambridge Observatory (England) with colored illustrations.
2887. **Phillips, Reuben.** An account of some experiments on volta-electric induction. (*Philos. Mag., Ser. III, Vol. 33, pp. 260-267.*) 8vo. *London, 1848*
Experiments similar to those of Prof. Henry of the Smithsonian Institution on induced currents at "making" and "breaking."
—See also 2904.

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2888. **Pluecker, (Julius).** (1801-1868.) Letter to Faraday on diamagnetism. (Philos. Mag., Ser. III, Vol. 33, pp. 48-49.) 8vo. *London, 1848*
Note on some analogies between magnetism and diamagnetism.
—See also 1164, 3104, 3141.
2889. **Wartmann, Elie (François).** (1817-1886.) Does induction affect the acoustic properties of elastic bodies? (Philos. Mag., Ser. III, Vol. 33, pp. 275-278.) 8vo. *London, 1848*
Electric or magnetic induction has no appreciable action on the elasticity of such bodies as copper, brass, soft-iron.
- 2890.—On the non-propagation by radiation of dynamic electricity. (Philos. Mag., Ser. III, Vol. 33, pp. 89-94.) 8vo. *London, 1848*
Current electricity does not possess the property of being reflected, refracted or polarized.
- 2891.—On the relations of electricity with bodies in the spheroidal state and on some properties of those bodies. (Philos. Mag., Ser. III, Vol. 33, pp. 439-446.) 8vo. *London, 1848*
—See also 1033, 3522.
2892. **Electric telegraphs.** (Companion to the Almanac for 1848, pp. 67-81.) 12mo. *London, 1848*
Bain's "chemical" telegraph; telegraph mileage in the United states.
2893. **Greenwich, England. Royal Observatory.** Results of magnetical and meteorological observations. Report (Greenwich Astronomical Observ. Appendix). 67 pp. 4to. *Greenwich, 1848*
Tabulated readings of the magnetometers.
—See also 2909, 4366.
2894. **Angelelli, (Marchioness) Massimiliano.** An veteres Italiae philosophi nullam de vi electrica ac de fulminum potissimum proprietatibus scientiam tenerent. (Novi commentarii Acad. Sc. Instit. Bononiensis, Vol. 9, pp. 1-10.) 4to. *Bologna, 1849*
Short paper on lightning and thunder according to ancient writers.
2895. **Barlow, W(illiam) H(enry).** On the cause of the diurnal variations of the magnetic needle. (Philos. Mag., Ser. III, Vol. 34, pp. 344-347.) 8vo. *London, 1849*
Note on the electric origin of the diurnal variations of the magnetic needle.
- 2896.—On the spontaneous electrical currents observed in the wires of the electric telegraph. (Philos. Trans. Roy. Soc., 1849, pp. 61-72.) 3 plates. 4to. *London, 1849*
Early observations on earth-currents tabulated and plotted.
—See also 5006.
2897. **(Clark, Josiah Latimer.)** (1822-1898.) General description of the Britannia and Conway tubular bridges on the Chester and Holyhead Railway. 34 pp. 8vo. *London, 1849*
Latimer Clark was assistant engineer on the construction of the bridges from 1848-1850. (See No. 1169.)

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- 2897a.—Seventh edition. 40 pp. ill. 1 plate. 8vo. *London, 1850*
 —See also 1509, 3228, 3282, 3387, 3439, 3532, 3573, 3575, 3601, 3684, 3719, 3819, 3853, 3871, 3992, 4075, 4120, 4162, 4172, 4262, 4341, 4427, 4437, 4453, 4509, 4520, 4608, 4777, 5014, 5019, 5023, 5028 to 5031, 5039, 5047 to 5049, 5051, 5052, 5054 to 5056, 5058 to 5062, 5064 to 5067, 5071, 5074, 5079, 5087 to 5092, 5097, 5101, 5108, 5114, 5118 to 5120, 5124, 5127, 5349, 5388, 5407, 5411, 5416, 5490, 5505, 5594, 5731, 5759, 5780, 5809, 5828, 5849.
2898. Despretz, (César Mansuète). (1792-1863.) Note sur la déviation de l'aiguille aimantée, par l'action des corps chauds et froids. (Comptes rendus, Acad. Sc., Paris, Vol. 29, pp. 225-227.) 4to. *Paris, 1849*
 Deflection of a galvanometer needle by the heat of the hand.
 —See also 903, 2914, 3280.
2899. Feilitzsch (Fabian Carl Ottokar). (1817-1885.) Eine Methode, galvanische Stroeme nach absolutem Maasse zu messen. (Ann. Phys. und Chem., Vol. 78, pp. 21-35.) 1 plate. 8vo. *Berlin, 1849*
 The method consists in comparing the magnetism developed in a disc with that of a permanent magnet.
2900. Grove, (Sir) William R(ober)t. (1811-1896.) On the effect of surrounding media on voltaic ignition. (Philos. Mag., Ser. III, Vol. 35, pp. 114-126.) 8vo. *London, 1849*
 Platinum wire heated by an electric current while surrounded by an atmosphere of hydrogen, oxygen, nitrogen, carbonic acid, coal gas, etc., showing the cooling effect of the gases used.
- 2900a.—(The same paper.) (Philos. Trans. Roy. Soc., 1849, pp. 49-59.) 4to. *London, 1849*
- 2901.—On the direct production of heat by magnetism. (Philos. Mag., Ser. III, Vol. 35, pp. 153-154.) 8vo. *London, 1849*
 When a bar of iron or other magnetic substance is magnetized, its temperature is raised; the author's well-known experiment showing the orientation of soft-iron filings, suspended in water, by the passage of a current in the magnetizing helix.
 —See also 2802.
2902. (Head, (Sir) Francis Bond.) (1793-1875.) Highways and dryways; or, The Britannia and Conway tubular bridges. 83 pp. 12mo. *London, 1849*
 Description of the Britannia Bridge across the Menai Strait. (See No. 1156.)
 —See also 1157.
2903. Matteucci, Carlo. (1811-1868.) Mémoire sur la propagation de l'électricité dans les corps solides isolants. (Ann. Chim. et Phys., Ser. III, Vol. 27, pp. 133-171.) 1 plate. 8vo. *Paris, 1849*
 Action of an electrified body on a neighboring non-conductor; rapidity of propagation of a negative charge.
 —See also 2728.
2904. Phillips, Reuben. On electricity and steam. (Philos. Mag., Ser. III, Vol. 35, pp. 490-497.) 8vo. *London, 1849*
 Experiments on the electrostatic effects of escaping steam with application to meteorology.
 —See also 2887.

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2905. **Quetelet**, (Lambert) A(dolphe Jacques). (1796-1874.) Rapport adressé à M. le Ministre de l'Intérieur, sur l'état et les travaux de l'observatoire Royale. 12 pp. 8vo. *Brussels, 1849*
Note on atmospheric electricity and terrestrial magnetism.
- 2906.—Sur le climat de la Belgique. De l'électricité de l'air. 76 pp. Folio. *Brussels, 1849*
Observations of atmospheric electricity made under the direction of the author.
- 2906a.—(The same paper.) Deuxième partie: Direction, intensité, durée et caractères distinctifs des vents. 75 pp. Folio. *Brussels, 1848*
Wind observations: their direction, intensity and duration.
—See also 2649.
2907. **Sabine**, (Sir) Edward. (1788-1883.) Contributions to terrestrial magnetism: containing a map of the magnetic declination for 1840, in the Atlantic Ocean, between the parallels of 60° North and 60° South latitude. (Philos. Trans. Roy. Soc., 1849, pp. 173-234.) 2 plates. 4to. *London, 1849*
- 2908.—Remarks on De la Rive's Theory of the causes which produce the diurnal variation of the magnetic declination. (From Proc. Roy. Soc., London, Vol. 5, pp. 821-825.) (Philos. Mag., Ser. III, Vol. 34, pp. 466-469.) 8vo. *London, 1849*
The aim of the paper is to show how De la Rive's theory of inequalities of temperature fails to explain the daily changes observed in the magnetic declination at any station.
—See also 2544.
2909. **Greenwich**, England. Royal Observatory. Description of the instruments and processes used in the photographic self-registration of the magnetical and meteorological instruments at the Royal Observatory. 10 pp. 3 plates. 4to. *London, 1849*
The description is accompanied by various photographic records.
—See also 2893.
2910. **Harris**, (Sir) William Snow. (1792-1867.) Electricity; being a concise exposition of the general principles of electrical science, and the purposes to which it has been applied.—Regulations of the Electric Telegraph Co. 1849.—**Moigno** (L'Abbé) (François Napoléon Marie). (1804-1884.) Traité de télégraphie électrique, renfermant son histoire, et la description des appareils. Paris, 1849. (Edinburgh Review, 1849, pp. 388-434.) 8vo. *Edinburgh, 1849*
A magazine-review of the two important works; definite meaning of such terms as quantity, tension, polarity. (See No. 1161.)
—See also 2556, 3310.
2911. **Birt**, William Radcliffe. (1804-1881.) On the connexion of atmospheric electricity with the condensation of vapour. (Philos. Mag., Ser. III, Vol. 36, pp. 161-171.) 8vo. *London, 1850*
Formation of clouds, production of rain, development of electricity.

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- 2912.—Report on the discussion of the electrical observations at Kew. (Report, British Ass. Adv. Sc. 1849, pp. 113-119.) 6 plates. 8vo. *London, 1850*
The report embraces the period 1843-1848.
2913. **Bombay.** Magnetical Observatory. Observations, for 1847. 11 tables. Folio. *Bombay, 1850*
Description of the observatory; instruments used; observations made.
2914. **Despretz, C(ésar Mansuète).** (1792-1863.) Cinquième communication sur la pile. Quelques nouvelles expériences sur le charbon. Longueurs de l'arc voltaïque. (Comptes rendus, Acad. Sc., Paris, Vol. 30, pp. 367-373.) 4to. *Paris, 1850*
Length of the electric arc with varying battery power when the carbons are vertical and also when horizontal; 600 Bunsen cells were used, variously grouped.
- 2914a.—Sixième communication sur la pile. (I.) Note sur le phénomène chimique et sur la lumière de la pile à deux liquides. (Comptes rendus, Acad. Sc., Paris, Vol. 31, pp. 418-422.) 4to. *Paris, 1850*
Electrochemical work done inside and outside a battery compared with the magnetic work as indicated by a tangent galvanometer.
- 2914b.—Septième communication sur la pile à deux liquides. Sur l'action chimique. (Comptes rendus, Acad. Sc., Paris, Vol. 33, pp. 185-193.) 4to. *Paris, 1851*
The water voltameter used in connection with Bunsen and Daniell batteries.
- 2914c.—Huitième communication sur la pile. (Comptes rendus, Acad. Sc., Paris, Vol. 34, pp. 737-746.) 4to. *Paris, 1852*
Experiments showing the weakening of the current from a Bunsen and a Daniell battery.
- 2914d.—Neuvième communication sur la pile. (Comptes rendus, Acad. Sc., Paris, Vol. 34, pp. 781-789.) 4to. *Paris, 1852*
Remarks on Ohm's law.
- 2914e.—Dixième communication sur la pile. (Comptes rendus, Acad. Sc., Paris, Vol. 35, pp. 449-459.) 4to. *Paris, 1852*
Note on the tangent galvanometer.
—See also 2898.
2915. **Harris, (Sir) W(illiam) Snow.** (1792-1867.) Letter on the preservation of public buildings from the destructive agency of lightning. 12 pp. 8vo. *London, 1850*
Short description of some churches that were struck by lightning.
—See also 2556.
2916. **Hearder, Jonathan N(ash).** (1809-1876.) On the application of cast-iron as a substitute for steel, in the construction of very powerful permanent magnets, with a specimen of a cast-iron magnet of great power, and a detail of some peculiar

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phenomena connected with its magnetic properties. (Trans. Polytechn. Soc., Cornwall, 1850, pp. 16-28.) 8vo.

Cornwall, 1850

The author's object was to introduce a material for the construction of permanent magnets which would combine cheapness and efficiency.

—See also 1360, 3028, 3061, 3096, 3132, 3188, 3349, 3398, 3451, 3639, 3665.

2917. Henry, Joseph. (1797-1878.) Analysis of the dynamic phenomena of the Leyden jar. (Proc. Amer. Adv. Sc., 1850, pp. 377-378.) 8vo. *Washington, 1850*

All the phenomena observed could be referred, says the author, to a series of *electric oscillations* in the discharge circuit of the jar.

—See also 2667.

2918. Joule, James Prescott. (1818-1889.) On the mechanical equivalent of heat. (Philos. Trans. Roy. Soc., 1850, pp. 61-82.) 4to. *London, 1850*

The determination when water was used gave 772.692 foot-lbs; with mercury, the value found was 774.083; with cast-iron, 774.987. The author considers the value derived from the friction of water *vis.* 772.692 as the most reliable.

- 2918a.—New determination of the mechanical equivalent of heat. (Philos. Trans. Roy. Soc., Vol. 169, pp. 365-383.) 3 plates. 4to. *London, 1879*

The method used was that of the electric calorimeter; the value obtained being 782.5 foot-lbs. per degree F. instead of 772.6 obtained from the friction of fluids.

—See also 2363, 3001, 3063, 3298, 3427, 3486, 3573.

2919. Matteucci, Carlo. (1811-1868.) Electro-physiological researches. 8th series. (On the conductivity of muscles and nerves.) (Philos. Trans. Roy. Soc., 1850, pp. 287-296.) 4to. *London, 1850*

Analogy between electricity and nervous force.

- 2920.—(The same paper.) 9th series. On induced contraction. (Philos. Trans. Roy. Soc., 1850, pp. 645-649.) 1 plate. 4to. *London, 1850*

"Induced contraction" is an electrical phenomenon developed in the act of contraction and lasting only for an instant.

—See also 2728.

2921. Molinier, Victor. Notice sur l'usage de la boussole au XIII^e siècle, et sur une loi du Code las siete Partidas d'Alfonse X, roi de Léon et de Castille, dans laquelle il est question de l'aiguille de mer. (Mém. Acad. Sc., Toulouse, Ser. III, Vol. 6, pp. 193-209.) 8vo. *Toulouse, 1850*

The origin of the mariner's compass briefly considered: the author refers to Alphonso X, King of Spain; Guyot de Provins, Brunetto Latini and Cardinal Jacques de Vitry.

2922. Quetelet, (Lambert) A(dolphe Jacques). (1796-1874.) Sur l'électricité atmosphérique. (Bull. Acad. Sc., Belgique, Vol. 17, pp. 3-13.) 1 plate. 8vo. *Brussels, 1850*

Letters from Matteucci and Peltier on atmospheric electricity.

—See also 2649.

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2923. **Ronalds, (Sir) Francis.** (1788-1873.) Report concerning the Observatory of the British Association at Kew, from August 9, 1848, to September 12, 1849. (Report, British Ass. Adv. Sc., 1849, pp. 120-142.) 5 plates. 8vo. *London, 1850*
Brief account of the experiments and operations conducted at the Kew Observatory during the year 1848-1849.
- 2923a.—(The same paper) from August 1, 1850 to July 1, 1851. (Report, British Ass. Adv. Sc., 1852, pp. 335-370.) 6 plates. 8vo. *London, 1852*
Remarks on instruments used in recording the electrical conditions of the atmosphere.
—See also 2534.
2924. **Tyndall, (John) (1820-1893) & (Karl) Hermann Knoblauch (1820-1895).** On the magneto-optic properties of crystals. (Second memoir.) (Philos. Mag., Ser. III, Vol. 37, pp. 1-33.) 8vo. *London, 1850*
Memorable paper in which the authors show that a paramagnetic crystal tends to place its axis of greatest density along the lines of force of a magnetic field.
—See also 2950.
2925. **Verdet, (Marcel) E(mile).** (1824-1866.) Note sur les courants induits d'ordre supérieur. (Ann. Chim. Phys., Ser. III, Vol. 29, pp. 501-506.) 8vo. *Paris, 1850*
Note on induced currents of various orders; also Henry's view of the *alternating* nature of the Leyden jar discharge.
—See also 2951, 2989, 3374.
2926. **Electricity—Magnetism—Electro-Magnetism.** (Chambers Information for the people, pp. 257-320+97-128.) L. 8vo. *Edinburgh, (1850?)*
General articles on electricity, magnetism and electro-magnetism.
2927. **Becquerel, (Alexandre) Edmond.** (1820-1891.) De l'action du magnétisme sur tous les corps. (3. Memoire.) (Ann. Chim. Phys., Ser. III, Vol. 32, pp. 68-112.) 8vo. *Paris, 1851*
Diamagnetism considered to be due to a differential action.
—See also 1439, 3118, 3164.
2928. **Billet, (Felix).** (1800-1882.) Sur la constitution de la lumière polarisés et la vraie cause des changements qui s'introduisent dans la différence des phases de deux rayons polarisés. (Mém. Acad. Sc., Dijon, Année 1851, pp. 73-83.) 8vo. *Dijon, 1851*
—See also 1196, 2982.
2929. **Boucherie.** Nota betreffende de bereiding van sparren palen, tegen bederf, volgens de vinding van den heer Boucherie. (Translated by J. Vincent.) 15 pp. ill. 2 tables. 8vo. *(1851?)*
Notes on the preparation of telegraph poles.
2930. **Broun, J(ohn) A(llan).** (1817-1879.) On the combined motions of the magnetic needle and on the Aurora Borealis. (Proc. Roy. Soc., Edinburgh, Vol. 2, pp. 334-350.) 2 plates. 8vo. *Edinburgh, 1851*
New hypothesis proposed by the author.
—See also 2846.

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2931. **Duchenne**, (Guillaume Benjamin Amand). Application de la galvanisation localisée à l'étude des fonctions musculaires. (Extrait, Bull. Acad. Nat. de Médecine, Vol. 16, pp. 609-622.) 16 pp. 8vo. *Paris, 1851*
- 2931a.—Exposition d'une nouvelle methode d'électrisation dite galvanisation localisée. Part II. (Extrait, Arch. génér. le Médecine.) 45 pp. 8vo. *Paris, 1851*
Description of some appliances used in the local application of the electric current.
- 2932.—Du choix des appareils d'induction au point de vue de leur application à la thérapeutique et à l'étude de certains phénomènes électro-physiologiques et pathologiques—Appareils Volta et magnéto-électriques (Faradiques) à double courant. (Extrait, Bull. Acad. Nat. de Médecine, Vol. 16, pp. 656-672.) 16 pp. 8vo. *Paris, 1851*
The author's induction coil and magneto-machine for medical purposes.
—See also 2973, 3020.
2933. **Electric Telegraph Co.** Register map indicating conditions of the atmosphere on the same day in several parts of Great Britain. 4to. *London, 1851*
—See also 1219, 4380, 4384, 4388, 4521, 4537, 4663, 4665, 4667, 4684, 4771, 5000, 5037, 5513.
2934. **Elliot**, Charles Morgan. (1815-1851.) Magnetic survey of the Eastern Archipelago. (Philos. Trans. Roy. Soc., 1851, pp. 287-331+clvii.) 1 map, 8 plates. 4to. *London, 1851*
Description of instruments used; tabulated magnetic data.
2935. **Fritsch**, Karl. (1812-1879.) Ueber die Temperatur-Verhaelt-nisse und die Menge des Niederschlages in Boehmen. (Sitz. Ber. Akad. Wiss. Math.-Nat. Kl., 1851, pp. 412-432.) 8vo. *Vienna, 1851*
Short paper on the temperature and amount of precipitation in Bohemia.
—See also 3128.
2936. **Gould**, B(enjamin) A(pthorp). (1824-1896.) On the velocity of the galvanic current in telegraph wires. (Amer. Journ. Sc. and Arts, Ser. II, Vol 11, pp. 67-82, 153-164.) 1 plate. 8vo. *New Haven, 1851*
The velocity deduced from the experiments described lies between 12,000 and 20,000 miles per second according to the electrical circumstances of the line.
—See also 1743.
2937. **Henry**, Joseph. (1797-1878.) On the theory of the so-called imponderables. (Proc. Amer. Soc. Adv. Sc., 1851, Part II, pp. 84-91.) 8vo. *Washington, 1851*
A few general considerations: suspicion of the oscillatory nature of the Leyden jar discharge, and emission of *electric waves*, p. 89.
—See also 2667.

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2938. **Masson**, A(ntoine) P(hilibert). (1806-1860.) Études de photométrie électrique. (Extrait, Ann. Chim. Phys., Ser. III, Vol. 31.) 32 pp. 1 plate. 8vo. *Paris, (1851?)*
Spectra of metals. (Autograph copy.) (See No. 1078bis.)
—See also 941.
2939. **Matteucci**, C(arlo). (1811-1868.) Sullo sviluppo dell' elettricità nella combinazione degli acidi colle basi. (Ann. Univ. Toscana, Sc. Cosmolog., Vol. 2, pp. 187-200.) 4to. *Pisa, 1851*
—See also 2728.
2940. **Morse**, Samuel F(inley) B(reese). (1791-1872.) Exposure of the conduct of Dr. Charles T. Jackson, leading to his discharge from the government service; also justice to Messrs. Foster and Whitney. 32 pp. 8vo *(1851?)*
—See also 1687, 5045, 5076.
2941. **Sabine**, (Sir) Edward. (1788-1883.) On periodical laws discoverable in the mean effects of the larger magnetic disturbances. (Philos. Trans. Roy. Soc., 1851, pp. 123-139.) 4to. *London, 1851*
It is inferred that magnetic disturbances must be attributed to general causes inasmuch as they are found to prevail on the same days in different and remote parts of the globe; also that their operation in any particular locality is regulated by a law which respects the hour of the place.
- 2941a.—(The same paper.) No. II. (Philos. Trans. Roy. Soc., 1852, pp. 103-124.) 4to. *London, 1852*
Analysis of observations taken at Toronto and Hobarton.
- 2941b.—(The same paper.) No. III. (Philos. Trans. Roy. Soc., 1856, pp. 357-374.) 4to. *London, 1856*
Periodical inequality of the larger magnetic disturbances, annual and diurnal.
- 2942.—On the annual variation of the magnetic declination at different periods of the day. (Philos. Trans. Roy. Soc., 1851, pp. 635-641.) 1 plate. 4to. *London, 1851*
Discussion of the observations taken at Toronto, Hobarton, Cape of Good Hope and St. Helena.
—See also 2544.
2943. **Schoenbein**, C(hristian) F(riedrich). (1799-1868.) On some secondary physiological effects produced by atmospheric electricity. (Medico-Chirurg. Trans., London, Vol. 34, pp. 205-220.) 8vo. *London, 1851*
Properties of ozone; methods of producing it; ozone was discovered by the author in 1839.
—See also 2732.
2944. **Singer**, Hermann. Bestimmung der elektromotorischen Kraft einer galvanischen Kette. (Sitz. Ber. Akad. Wiss. Math.-Nat. Kl., 1851, pp. 411-412.) 8vo. *Vienna, 1851*
Note on the determination of the *e. m. f.* of a battery.
2945. **Sturgeon**, William. (1783-1850.) On lightning and lightning conductors. (Mem. Manchester Phil. Soc., Vol. 9, pp. 56-79.) 8vo. *Manchester, 1851*
The author expresses some doubt as to the correctness of Franklin's views on the efficiency of pointed conductors.
—See also 925.

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2946. Thomson, (Sir) William. (Lord Kelvin.) (1824-1907.) Application of the principle of mechanical effect to the measurement of electro-motive forces, and of galvanic resistance in absolute units. (Philos. Mag., Ser. IV, Vol. 2, pp. 551-562.) 8vo. *London, 1851*
This important paper deals with the measurement of electro-motive force in absolute units.
- 2947.—A mathematical theory of magnetism. (Philos. Trans. Roy. Soc., 1851, pp. 243-285.) 4to. *London, 1851*
General definitions and laws followed by full mathematical treatment.
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- 2949.—On the mechanical theory of electrolysis. (Philos. Mag., Ser. IV, Vol. 2, pp. 429-444.) 8vo. *London, 1851*
One of the author's epoch-making papers showing the relation between the e. m. f., the electrochemical equivalent and the mechanical equivalent of the chemical effects produced by the consumption of a given amount of the materials of a battery.
—See also 1085, 2987, 3008, 3038, 3070, 3108, 3150, 3211, 3263, 3371, 3265, 3378, 3427, 3486, 3565, 3573, 3613, 3743, 3770, 3800, 3974, 4046, 4162, 4400, 4640, 4642, 4917, 5083, 5386, 5398, 5403, 5490.
2950. Tyndall, John. (1820-1893.) On the laws of magnetism. (Philos. Mag., Ser. IV, Vol. 1, pp. 265-295.) 8vo. *London, 1851*
The mutual attraction between a magnet and a sphere of soft iron.
—See also 1586, 2924, 2967, 2988, 3009, 3041, 3072, 3152, 3214, 3763, 3804, 3849, 4048, 4835.
2951. Verdet, (Marcel) E(mile). (1824-1866.) Recherches sur les phénomènes d'induction produits par le mouvement des métaux magnétiques ou non-magnétiques. (Ann. Chim. Phys., Ser. III, Vol. 31, pp. 187-217.) 1 plate. 8vo. *Paris, 1851*
Magnetic induction is not an instantaneous phenomenon.
—See also 2925.
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- cess of secretion in living animals. (Philos. Trans. Roy. Soc., 1852, pp. 279-288.) 4to. *London, 1852*
Experimental evidence of electrical manifestations during the process of secretion.
—See also 1480, 2994.
2956. Blanchard, E(dward) L(eman). The song of the electric telegraph. Set to music by Wm. Thorold Wood. 5 pp. Folio. *London, (1852?)*
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Diagrams of the mechanism adopted.
—See also 2516.
2958. Channing, William F. On the municipal electric telegraph especially in its application to fire-alarms. (Amer. Journ. Sc. & Arts, Ser. II, Vol. 13, pp. 58-83.) ill. 8vo. *New Haven, 1852*
Description of the apparatus of Moses G. Farmer as used in the City of Boston. (Autograph copy, dedicated to Prof. Buff.)
—See also 1317.
2959. Clausius, R(udolph) Julius Emmanuel). (1822-1888.) Ueber die von Grove beobachtete Abhaengigkeit des galvanischen Gluehens von der Natur des umgebenden Gases. (Ann. Phys. und Chem., Vol. 87, pp. 501-513.) 8vo. *Berlin, 1852*
Conduction of heat through different gases.
—See also 1669, 3055.
2960. Donovan, M(ichael). (1790- ? .) On the supposed identity of the agent concerned in the phaenomena of ordinary electricity, voltaic electricity, electromagnetism, magneto-electricity, and thermo-electricity. (Philos. Mag., Ser. IV, Vol. 3, pp. 335-347.) 8vo. *London, 1852*
Estimate of the quantity of electricity that passes in Leyden jar discharges; Faraday's electrical investigations.
—See also 2526.
2961. Faraday, Michael. (1791-1867.) On the lines of magnetic force. (Proc. Roy. Instit., Great Britain, Vol. I, pp. 105-108.) 8vo. *London, 1852*
—See also 2549.
2962. Goodman, J(ohn). On the identity of light, heat, electricity, magnetism, and gravitation. (Mem. Manchester Philos. Soc., Vol. 10, pp. 155-171.) 4to. *London, 1852*
"These experiments indicate and prove the identity of galvanic and voltaic force."
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Experiments affording a new link in the chain of analogy connecting dielectric induction with electrolysis.
—See also 2802.

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London, 1852
—See also 1400, 2974, 3002.
2965. **Lefroy**, (Sir) J(ohn) H(enry). (1817-1890.) On the irregular fluctuations of the magnetical elements at the stations of magnetical observation in North America. 13 pp. 1 plate, 1 table. 8vo. *Albany, 1852*
The author points out that for the American Continent there would seem to be two daily periods of maximum disturbance in magnetic declination.
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Pamphlet of theoretical views and practical rules. (Autograph copy.)
—See also 4279.
2967. **Tyndall**, John. (1820-1893.) Reports on the progress of the physical sciences. (Philos. Mag., Ser. IV, Vol. 3, pp. 321-330.) 8vo. *London, 1852*
Reception of Ohm's theory; Kohlrausch's experimental verification of Ohm's law. (See No. 2964.)
—See also 2950.
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—See also 2855.
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Some pathological and therapeutic uses of the current.
—See also 2931.

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Berlin, 1853
- 2975.—Das Sinus-Elektrometer. (Ann. Phys. und Chem., Vol. 88, pp. 497-519.) 1 plate. 8vo.
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Note on a method of comparing the *e. m. f.* of batteries.
—See also 1129.
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Remarks on the specific heat of electricity.

—See also 2946.

2988. Tyndall, John. (1820-1893.) On the vibrations and tones produced by the contact of bodies having different temperatures. (Philos. Trans. Roy. Soc., 1854, pp. 1-10.) 4to. *London, 1854*

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—See also 2950.

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—See also 2925.

2990. Wynter, Andrew.) The electric telegraph. (Quarterly Review, Vol. 95, pp. 119-164.) 8vo. *London, 1854*

Review of telegraphic discovery and enterprise; frequent references to Cooke and Wheatstone.

2991. Telegraphie.. (Didaskalia, Sept. 2, 1854.) 4to. *Frankfort, 1854*
Series of articles on the history and development of the electric telegraph and telephone; proposed telegraphic communication with America.

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This volume also contains an account of the electric and chronographic apparatus of the Greenwich observatory, as also the determination of the longitude of Valencia, Ireland.

—See also 2750.

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Static electricity: descriptive, practical and theoretical.
- 2996.—Electricity. (Encyclopaedia Britannica, New edition, pp. 523-627.) 9 plates. 4to. *London, 1855*
Extensive treatise historical, theoretical and experimental. Newton's glass-globe machine; Gordon's glass-cylinder; Watson coats the inside and outside of Leyden jar with tinfoil, Dr. Bevis coats pane of glass on both sides; Franklin's kite, June, 1752; Ronalds' electroscope and electric telegraph.
—See also 1197.
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—See also 2859.
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The method consisted in connecting Leyden jars or other condensers with the secondary of an induction coil.
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—See also 2964.
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—See also 1235.
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The observations were made every alternate hour night and day; discussion of disturbances; charts showing the daily and yearly variation. (Autograph copy.)
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—See also 3146.
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The excitement of diamagnetic bodies when placed in a magnetic field held to be of a dual nature; important contribution to the phenomena and theory of diamagnetism.
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3016. **Proceedings** of a meeting held at Kurachee, to consider the subject of direct steam communication between Kurachee and Suez. 16 pp. 1 map. 8vo. *Kurachee, 1855*
3017. **Airy**, (Sir) G(eorge) B(iddell). (1801-1892.) Account of pendulum experiments undertaken in the Harton colliery to determine the mean density of the earth. (From the Philos. Trans. Roy. Soc., 1856, pp. 53-99.) 4to. *London, 1856*
Theory of the experiment; coöperation of Dr. Whewell; journal of operations; the value found for the mean density was 6.565; Cavendish found 5.448; Vernon Boys, 5.527; Poynting, 5.4934.
- 3018.—Discussion of the observed deviations of the compass in several ships, wood-built and iron-built: with a general table for facilitating the examination of compass-deviations. (Philos. Trans. Roy. Soc., 1856, pp. 53-99.) 4to. *London, 1856*
The discussion of the mathematical principles as well as of the observations is followed by a number of practical inferences and suggestions.
—See also 2750.

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3019. **Bouvier.** Sur une note de Duchenne: de quelques nouvelles propriétés différentielles des courants d'induction de I et II ordres. 7 pp. 8vo. (Paris), 1856
Curative properties of induced currents of the first and second orders.
3020. **Duchenne, (Guillaume Benjamin Amand).** Note sur quelques nouvelles propriétés différentielles des courants d'induction de I et II ordres. ii pp. 8vo. Paris, 1856
Therapeutical properties of induced currents.
—See also 2931.
3021. (**Field, Cyrus West**). (1819–1892.) Statement of some of the advantages attendant upon making St. John's, Newfoundland, a port of call for Transatlantic steamers. 12 pp. 1 map. 8vo. London, 1856
List of 25 soundings in the Atlantic with remarks (in pencil), on the nature of the ocean floor (1856). Map of projected cable route. (See No. 3090.)
—See also 1389, 3090, 4007, 4393, 4580, 5358, 5408.
3022. **Gore, G(eorge).** On the electrical relations of lead and antimony in various conducting liquids. (Pharmac. Journ., Vol. 15, pp. 413–415.) 8vo. London, 1856
Lead more electro-positive than antimony in conducting liquids generally.
—See also 1357, 3131, 3181, 3235, 3294, 3347, 3397, 3580, 3638, 3664, 3690, 3723, 3755, 3822, 3939, 4011, 4080, 4125, 4227, 4265, 4305, 4315, 4324, 4343, 4355.
3023. **Gros, (Jean B. Louis).** Lettre sur la télégraphie électrique. 31 pp. 18 plates. 8vo. Paris, 1856
Simple popular explanation of the transmission of electric signals.
- 3023a.—(German translation.) Anschauliche Darstellung der elektrischen Telegraphie zur Verstaendlichung des grossen Publicums. In einem Briefe an eine Dame. Nach dem Franzoesischen. 38 pp. 18 plates. 8vo. Weimar, 1857
3024. **Grove, (Sir) W(illiam) R(obert).** (1811–1896.) Inferences from the negation of perpetual motion. (Proc. Roy. Instit., Great Britain, Vol. 2, pp. 152–159.) 8vo. London, 1856
"The recent progress of science is continually tending to get rid of occult qualities or latent entities," p. 8.
—See also 2802.
3025. **Harris, (Sir) William Snow.** (1792–1867.) On a general law of electrical discharge. (Philos. Mag., Ser. IV, Vol. 11, pp. 339–360.) 1 plate. 8vo. London, 1856
The author's "thermo-electrometer," p. 6.
- 3026.—On certain phaenomena of electrical discharge. (Philos. Mag., Ser. IV, Vol. 12, pp. 136–140.) 8vo. London, 1856
Remarks on the author's "unit jar."
- 3027.—On quantitative measurement in statical electricity and on some new phenomena of electrical force. (Proc. Roy. Soc., Vol. 8, pp. 166–171.) 8vo. London, 1856
Remarks on Coulomb's law.
—See also 2556.

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3028. **Hearder, Jonathan, N(ash).** (1809-1876.) On a powerful form of the induction coil, with some new statical and thermal effects of the induced current. (*Philos. Mag., Ser. IV, Vol. 12, pp. 377-386.*) 8vo. *London, 1856*
 Leyden batteries charged by inductive effect of distant electric storm, p. 9.
- 3029.—On a new arrangement of the induction coil. (*Philos. Mag., Ser. IV, Vol. 12, pp. 443-445.*) 8vo. *London, 1856*
 Note on effects obtained from the author's induction coil with description of apparatus.
 —See also 2916.
3030. **Mahmoud-Effendi.** Etat actuel des éléments du magnétisme terrestre à Paris et dans ses environs. (*Comptes rendus, Acad. Sc., Vol. 42, pp. 905-909.*) 4to. *Paris, 1856*
 Variation of magnetic dip with distance from Paris.
- 3031.—Mémoire sur l'état actuel des lignes isocliniques et isodynamiques dans la Grande-Bretagne, la Hollande, la Belgique et la France. (*Mém. Couronn. et Mém. Sav. Etrang. Acad. Sc. Bruxelles, Vol. 29, pp. 1-47.*) 1 map. 4to. *Brussels, 1856*
 The dip was determined at 45 stations; the total force at 22. Kaemitz's method for determining the dip is given on p. 9.
3032. **Masarnau, Vicente Santiago, Manuel Rioz y Pedraya & Pedro Miranda.** Informe de la Real Academia de Ciencias sobre telegrafia electrica. (*Mem. Real Acad. Ciencias, Madrid, Vol. 3, pp. 93-184.*) 5 plates. 4to. *Madrid, 1856*
 The telegraphs of Morse, Bain and Breguet.
3033. **Matthiessen, A(ugustus).** (1831-1870.) Preliminary notice on the electric conducting power of the alkaline metals. (*Philos. Mag., Ser. IV, Vol. 12, p. 199.*) 8vo. *London, 1856*
 Note on the conductivity of sodium and lithium.
- 3033a.—On the electric conducting power of the metals of the alkalis and alkaline earths. (*Philos. Mag., Ser. IV, Vol. 12, pp. 81-90.*) 1 plate. 8vo. *London, 1857*
 Conductivity of lithium, potassium, and sodium.
 —See also 1685, 3102, 3194, 3245, 3305, 3353, 3378, 3404, 3427, 3462, 3486, 3510, 3573.
3034. **Maxwell, James Clerk.** (1831-1879.) On Faraday's lines of force. (*Cambridge Philos. Soc., Vol. 10, pp. 3-59.*) 4to. *Cambridge, 1856*
 Nature and properties of *lines of force*.
 —See also 1872, 3247, 3308, 3427, 3463, 3486, 3512, 3552, 3573, 3587, 3669, 3731, 3770, 3881, 3955.
3035. **Quincke, G(eorg Hermann).** Ueber die Verbreitung eines elektrischen Stromes in Metallplatten. (*Ann. Phys. und Chem., Vol. 97, pp. 382-396.*) 1 plate. 8vo. *Berlin, 1856*
 Current stream-lines in plane conductors.
 —See also 3200.

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3036. **Sabine**, (Sir) Edward. (1788-1883.) On the lunar-diurnal magnetic variation at Toronto. (Philos. Trans. Roy. Soc., 1856, pp. 499-506.) 1 plate. 4to. *London, 1856*
The magnetic action of the moon recognized; the present investigation refers to the moon's diurnal influence on both components of the earth's magnetic force.
—See also 2544.
3037. **Stephenson**, (Sir) Rowland Macdonald. The world's highway. (From the Calcutta Review, March 1856.) 35 pp. 1 map. 8vo. *Serampore, 1856*
The overland route to India.
3038. **Thomson**, (Sir) W(illiam) (Lord Kelvin). (1824-1907.) On the electro-dynamic qualities of metals. (Philos. Trans. Roy. Soc., 1856, pp. 649-751.) ill. 1 plate. 4to. *London, 1856*
Memorable paper on thermo-electric phenomena: electric conduction of heat; thermo-electric inversion; effect of magnetization on electric conductivity.
- 3039.—On the origin and transformations of motive power. (Proc. Roy. Instit., Great Britain, Vol. 2, pp. 199-204.) 8vo. *London, 1856*
Available sources of energy traced to solar heat and the rotation of the earth.
- 3040.—On practical methods for rapid signalling by the electric telegraph. (Proc. Roy. Soc., Vol. 8, pp. 299-307.) 8vo. *London, 1856*
Mirror galvanometer proposed as a receiver for telegraph messages.
—See also 2946.
3041. **Tyndall**, John. (1820-1893.) On the relation of diamagnetic polarity to magnecrystalline action. (Philos. Mag., Ser. IV, Vol. 11, pp. 125-137.) 8vo. *London, 1856*
One of the author's remarkable researches. (Autograph copy, dedicated to Prof. Buff.)
- 3042.—Further researches on the polarity of the diamagnetic force. (Philos. Trans. Roy. Soc., 1856, pp. 237-259.) 4to. *London, 1856*
This remarkable paper concludes with the following affirmation: "Thus have we seen the objections raised against diamagnetic polarity fall away one by one, and a body of evidence accumulated in its favor, which places it among the most firmly established truths of science;" Faraday did not think so.
- 3042a.—(The same paper.) (Philos. Mag., Ser. IV, Vol. 12, pp. 161-184.) 8vo. *London, 1856*
—See also 2950.
3043. **White**, William. Swedenborg, his life and writings. (Reprinted from the Phonetic Journ.) vii+156 pp. 12mo. *London, 1856*
Scientific work of the Swedish theosophist is appraised in Chapter IV.
3044. **Application** of the theory of the conduction of electricity through solids, etc. 16 pp. 8vo. (*London, 1856?*)
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On the striated discharge in vacuum tubes.
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The proposed telegraph line was to connect the Persian Gulf cable with Aleppo and Seleucia.
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The description is accompanied by a MS. letter to Latimer Clark from George Biddell Airy, Director of the Observatory.
—See also 2750.
3048. **Baumgartner, A(ndreas) von.** (1793-1865.) Ueber Gewitter ueberhaupt, Hagelwetter insbesondere. (Sitz. Ber. Akad. Wiss. Math.-Nat. Kl., Vol. 23, pp. 277-302.) 8vo. Vienna, 1857
Storms in general with special reference to hail-storms.
—See also 1347.
3049. **Belli, G(iuseppe).** (1791-1860.) Sulla possibilita di contrarie correnti elettriche simultanee in uno stesso filo conduttore; memoria seconda. (Nuovo Cimento, Vol. 6, pp. 81-123.) 1 plate. 8vo. Pisa, 1857
Explanation of certain current phenomena according to the one-fluid theory.
—See also 864, 3079.
3050. **Blakely, (Captain).** The submerging of electric telegraph cables. (From a report to the Minister of War (?), pp. 10-12.) ill. Folio. London, 1857
Rate of sinking of light and heavy cables.
- 3050a.—(The same paper.) (A report extract from paper read before the British Association.) London, 1857
(Autograph copy.)
3051. **Bodie, James.** Observations on laying telegraphic cables in the deep sea. 9 pp. 1 plate. 12mo. Devonport, 1857
The author was on board the *Agamemnon* when laying the Atlantic cable.
Note on the specific gravity of the cable.
3052. **Bosscha, J(ohannes, jr.)** Ueber mechanische Theorie der Elektrolyse. (Ann. Phys. und Chem., Vol. 101, pp. 517-549.) 8vo. Berlin, 1857
The dynamical theory of electrolysis.
—See also 1276.
3053. **Brett, John Watkins.** (1805-1863.) On the submarine telegraph. (Proc. Roy. Instit., Great Britain, Vol. 2, pp. 394-402.) 8vo. London, 1857
Narrative of cable enterprises with which the author was connected.
—See also 1411, 4559.
3054. **Brooke, J. M.** On ocean telegraphs. (From a report to the British Minister of War (?), pp. 7-9.) Folio. London, 1857
The possibility of laying an ocean cable.

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3055. **Clausius**, R(udolph Julius Emmanuel). (1822-1888.) Ueber die Elektricitätsleitung in Elektrolyden. (Ann. Phys. und Chem., Vol. 101, pp. 338-360.) 8vo. *Berlin, 1857*
Remarks on the theory of Grotthus tending to bring it into harmony with the modern ideas of energy.
—See also 2959.
3056. **Eastern Counties Railway**. Rules and regulations, September 12, 1854. 187 pp. 16mo. *Stratford, 1857*
—See also 4402.
3057. **Ghijben**, J(acob) Badon. (1798-1870.) Over de bepaling spherische aberratie der linzen. (Verslag, Acad. Wetensch., Vol. 6, pp. 271-282.) 8vo. *Amsterdam, 1857*
Spherical aberration of lenses mathematically treated.
3058. **Harris**, (Sir) William Snow. (1792-1867.) Researches in statical electricity. (Philos. Mag., Ser. IV, Vol. 14, pp. 81-100-176-183.) 1 plate. 8vo. *London, 1857*
Theory of the proof-plane; distribution of electricity on conductors, surface density, etc.
- 3059.—On some special laws of electrical force. (Philos. Mag., Ser. IV, Vol. 14, pp. 156-159.) 8vo. *London, 1857*
Law of the development of heat by Leyden battery discharges.
- 3059a.—Further inquiries concerning the laws and operation of electrical force. (Philos. Mag., Ser. IV, Vol. 29, pp. 65-75.) 8vo. *London, 1865*
Definite meaning of certain electrical terms e. g., quantity, charge and intensity.
- 3060.—On some recent instances of ships and buildings struck by lightning. (Reprinted from the Nautical Mag., 1857.) 9 pp. 8vo. *London, (1857?)*
Accounts of violent electric storms.
—See also 2556.
3061. **Hearder**, Jonathan N(ash). (1809-1876.) On some new statical and thermal effects of the induction coil, with a new instrument for registering a rapid succession of electrical discharges. 14 pp. 8vo. *Plymouth, 1857*
Experiments showing the heating effect of induction coil discharges.
—See also 2916.
3062. **Highton**, Edward. Consideration of the probability of the success of the Atlantic Cable. 21. Folio. *London, 1857*
"My opinion is that it is possible that the present (1857) Atlantic Telegraph Cable may be submerged successfully, but that is by no means probable."
—See also 1098, 4540, 5009.
3063. **Joule**, J(ames) P(rescott). (1818-1889.) On the thermo-electricity of ferruginous metals, and on the thermal effects of stretching solid bodies. (Proc. Roy. Soc., Vol. 8, pp. 355-356.) 8vo. *London, 1857*
Contraction of stretched india-rubber when heated.
—See also 2918.

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3065. **Magnus**, (Heinrich) G(ustav). (1802-1870.) Elektrolytische Untersuchungen. (Ann. Phys. und Chem., Vol. 102, pp. 1-54.) 8vo. *London, 1857*
Some general phenomena of electrolytic deposition with special reference to Prof. Daniell's researches.
—See also 1210, 3101, 3239, 3351.
3066. **Malone**, Thomas A. On the application of light and electricity to the production of engravings—Photogalvanography. (Proc. Roy. Instit., Great Britain, Vol. 2, pp. 343-350.) 8vo. *London, 1857*
Three methods are briefly described in which light was used to aid the art of the engraver.
—See also 3403.
3067. **Matteucci**, C(arlo). (1811-1868.) Electro-physiological researches: Tenth series, Part I. Physical and chemical phenomena of muscular contraction. (Philos. Trans. Roy. Soc., 1857, pp. 129-143.) 4to. *London, 1857*
Development of heat and electricity by the muscle when in the act of contracting.
- 3067a.—(The same paper.) Abstract. (Proc. Roy. Soc., Vol. 8, pp. 209-211.) 8vo. *London, 1857*
—See also 2728.
3068. **Sabine**, (Sir) Edward. (1788-1883.) On the evidence of the existence of the decennial inequality in the solar-diurnal magnetic variations, and its non-existence in the lunar-diurnal variation of the declination at Hobarton. (Philos. Trans. Roy. Soc., 1857, pp. 1-8.) 1 plate. 4to. *London, 1857*
The observations taken at Toronto and at Hobarton show the existence of a decennial period in the magnetic variation in the case of the sun but not in the case of the moon.
- 3069.—On hourly observations of the magnetic declination made by Captain Rochfort Maguire, R. N., and the officers of H. M. S. *Plover*; in 1852, 1853 and 1854, at Point Barrow, on the shores of the Polar Sea. (Philos. Trans. Roy. Soc., 1857, pp. 497-532.) 4to. *London, 1857*
The hourly observations at Point Barrow were made in 1852, 1853, 1854. The results are compared with those made at Toronto.
—See also 2544.
3070. **Thomson**, (Sir) William (Lord Kelvin). (1824-1907.) On peristaltic induction of electric currents. (Philos. Mag., Ser. IV, Vol. 13, pp. 135-145.) 8vo. *London, 1857*
The author introduced the term *peristaltic* to characterize the kind of induction by which currents are excited in elongated conductors through variation of electrostatic potential in surrounding matter.

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- 3070a.—(The same paper.) Abstract. (Proc. Roy. Soc., Vol. 8, pp. 121-132.) 8vo. *London, 1857*
- 3071.—On the electric conductivity of commercial copper of various kinds. (Proc. Roy. Soc., Vol. 8, pp. 550-555.) 8vo. *London, 1857*
- Some conditions that influence electric conductivity.
—See also 2946.
3072. Tyndall, John. (1820-1893.) On the sounds produced by the combustion of gases in tubes (Philos. Mag., Ser. IV, Vol. 13, pp. 473-479.) 8vo. *London, 1857*
- The cause assigned is the explosion produced by the periodic combination of atmospheric oxygen with the jet of hydrogen gas.
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3073. Window, (Frederick Richard). On submarine electric telegraphs. (Proc. Instit. Civil Engin., Vol. 16, pp. 188-202.) 8vo. *London, 1857*
- Discussion which followed the reading of the paper.
—See also 1307, 3113.
3074. Atlantic telegraph cable. (Nautical Mag., Vol. 26, pp. 439-445.) 8vo. *London, 1857*
- Generalities concerning the Atlantic cable of 1857.
3075. The Leviathan; a description of Mr. Scott Russell's great ship, built at Millwall, for the Eastern Steam Navigation Company. 15 pp. ill. pl. 12mo. *London, (1857)*
3076. Treatise on electricity in theory and practice by Auguste (Arthur) De la Rive. Translated by Charles V(incent) Walker. (pp. 26-62.) 8vo. *London, 1857*
- A review of the translation. (See No. 1251.)
3077. Airy, (Sir) G(eorge) B(iddell). (1801-1892.) The Atlantic cable problem. (Nautical Mag., Vol. 27, pp. 265-269.) 8vo. *London, 1858*
- Form assumed by descending submarine cable; tension at various points; speed of delivery.
- 3078.—On the mechanical conditions of the deposit of a submarine cable. (Philos. Mag., Ser. IV, Vol. 16, pp. 1-18.) 8vo. *London, 1858*
- Mathematical paper on the submergence of a cable.
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3079. Belli, G(iuseppe). (1791-1860.) Sulle induzione elettrostatiche. (Nuovo Cimento, Vol. 7, pp. 97-110.) 1 plate. 8vo. *Pisa, 1858*
- Criticism of some contemporary views on electrostatic induction.
—See also 3049.
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- Note on Balestrini's cable.

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Detailed tabulated record of the conductivity of metals.
—See also 3124, 3125.
3084. Crace-Calvert, F(rederick) (1819-1873), Richard Johnson (1810?-1881) & G. Cliff Lowe. On the expansion of metals and alloys. (Reprinted from the Mechanics' Mag.) 7 pp. pl. 8vo. *London, 1858*
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—See also 3083.
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The electric clock of the Royal Observatory, Greenwich.
—See also 2627.
3086. Ermerins, J(an) W(illem). (1798-1869.) Over de identiteit van licht en stralende warmte. (Verslag, Akad. Wetensch., Vol. 7, pp. 81-99.) 8vo. *Amsterdam, 1858*
Identity of light and radiant heat.
3087. F.... J. Electro-motor machines. (Journ. Soc. Arts, Vol. 6, p. 313.) 4to. *London, 1858*
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3089. Faraday, Michael. (1791-1867.) On Wheatstone's electric telegraph in relation to science. (Proc. Roy. Instit., Great Britain, Vol. 2, pp. 555-560.) 8vo. *London, 1858*
—See also 2549.
3090. Field, Cyrus W(est). (1819-1892.) Remarks of Cyrus W. Field, at St. John's Newfoundland and New York, after the laying of the Atlantic Telegraph Cable in 1858. 2 l. 4to. *London, 1858*
—See also 3021.
3091. Gassiot, John P(eter). (1797-1877.) The Bakerian lecture. On the stratifications and dark band in electrical discharges

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as observed in Torricellian vacua. (Philos. Trans. Roy. Soc., 1858, pp. 1-16.) 1 plate. 4to. *London, 1858*

Account of experimental inquiry into the nature of the electric discharge in rarefied media.

- 3091a.—On the stratifications in electrical discharges as observed in Torricellian and other vacua. Second communication. (Philos. Trans. Roy. Soc., 1859, pp. 137-160.) 1 plate. 4to.

London, 1859

Experimental study of the discharge from both terminals of a "vacuum" tube.

—See also 2819.

3092. **Gravatt, William.** (1806-1866.) On the Atlantic Cable. (Philos. Mag., Ser. IV, Vol. 16, pp. 34-37.) 8vo. *London, 1858*

Strain on a submarine cable during the process of laying.

3093. **Grove, (Sir) William R(obert).** (1811-1896.) On the striae seen in the electrical discharge in vacuo. (Philos. Mag., Ser. IV, Vol. 16, pp. 18-22.) 8vo. *London, 1858*

—See also 2802.

3094. (**Harris, (Sir) William Snow.**) (1792-1867.) Destructive agency of lightning. I. Gunpowder explosions by lightning.—II. Sacred edifices and other important public buildings burned or partially destroyed by lightning.—III. Remarkable instances in which ships and vessels of various kinds have been burned and otherwise destroyed by the electrical discharge. (Extracts from the Nautical Mag., Vol. 27.) 2+2+3 pp. 8vo.

London, 1858

- 3095.—**H. M. S. Shannon** struck by lightning. (Reprinted from the Nautical Mag., Vol. 27.) 2 pp. 8vo. *London, 1858*

Ship struck three times and saved by her lightning conductors.

—See also 2556.

3096. **Hearder, Jonathan N(ash).** (1809-1876.) On the difference in the amount of electricity developed by equal surfaces of cylinder and plate electrical machines. (Philos. Mag., Ser. IV, Vol. 15, pp. 290-299.) 8vo. *London, 1858*

Study of the action and efficiency of each part of frictional machines.

—See also 2916.

3097. **Hood, R. Jacob.** On the construction and arrangement of railway stations. (Instit. Civil. Engin., Proc., Paper 1857-1858 No. 19.) 14 pp. 8vo. *London, 1858*

In the discussion, Prof. Airy made a brief communication on submerging telegraph cables.

3098. **Laming, Richard.** A challenge in a letter on electrical education, addressed to H. R. H., the Prince Consort. 7 pp. 8vo. *London, 1858*

The author thinks his theory "competent to carry Professor Faraday at once to a proper understanding of that polarization which his practical sagacity long ago detected around him, but could not comprehend."

—See also 961.

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3099. Lloyd, H(umphrey). (1800-1881.) On the direct magnetic influence of our distance luminary upon the diurnal variations of the magnetic force at the earth's surface. (Philos. Mag., Ser. IV, Vol. 15, pp. 192-196.) 8vo. *London, 1858*
The diurnal variation of the magnetic elements not caused by the direct magnetic action of the sun or moon.
—See also 2726.
3100. Loomis, Elias. (1811-1889.) On the electrical phenomena observed in certain houses in New York. (Amer. Journ. Sc. & Arts, Ser. II, Vol. 26, pp. 58-64.) 8vo. *New Haven, 1858*
Electrification due to walking briskly across a room; velvet carpet best of all.
—See also 2866.
3101. Magnus, (Heinrich) G(ustav). (1802-1870.) Ueber directe und indirecte Zersetzung durch den galvanischen Strom. (Ann. Phys. und Chem., Vol. 104, pp. 553-580.) 8vo. *Leipzig, 1858*
Electrolytic decomposition.
—See also 3065.
3102. Matthiessen, Augustus. (1831-1870.) On the thermo-electric series. (Philos. Trans. Roy. Soc., 1858, pp. 369-387.) ill. 4to. *London, 1858*
Determination of the places in the thermoelectric series of the metals of the alkalies and alkaline earths together with most other metals and some alloys.
—See also 3033.
3103. Nölloth, M. S. On the submergence of the Atlantic telegraph cable. (From the Journ. United Service Instit., Vol. 11.) 15 pp. 8vo. *London, (1858?)*
Suggestions by the author on the submergence of cables; also criticism of some proposed schemes.
3104. Pluecker, Julius. (1801-1868.) On the magnetic induction of crystals. (Philos. Trans. Roy. Soc., 1858, pp. 543-587.) 1 plate. 4to. *London, 1858*
Mathematical and experimental paper.
—See also 2888.
3105. Sabine, (Sir) Edward. (1788-1883.) On hourly observations of the magnetic declination, made by Captain Rochfort Maguire, R. N., in 1852, 1853, 1854, at Point Barrow, on the shores of the Polar Sea. (Philos. Mag., Ser. IV, Vol. 16, pp. 51-54.) 8vo. *London, 1858*
- 3106.—Remarks upon the magnetic observations transmitted from York Fort in Hudson's Bay, in August 1857, by Lieut. Blakiston. (Proc. Roy. Soc., Vol. 9, pp. 81-91.) 8vo. *London, 1858*
Magnetic forces in the Hudson Bay region.
—See also 2544.

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Address on the origin and growth of the electric telegraph; Oersted said to have been anticipated by Romagnosi of Trent, 1802.
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Effect of a magnetic field on the plane of polarization.
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Valencia and Galway as Atlantic steamship stations.
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Paper based on the author's experience in laying and repairing deep-sea cables, followed by a lengthy discussion.
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Among the members of the committee were: Latimer Clark, C. W. Siemens, Prof. E. Solly.

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3116. **The Atlantic cable.** (Nautical Mag., Vol. 27, pp. 225-265.) 8vo. *London, 1858*
Discussion of the engineer's report, cable of 1857.
3117. **The Atlantic telegraph.** (North British Review, Vol. 29, pp. 519-555.) 8vo. *Edinburgh, 1858*
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Résumé of the causes of atmospheric electricity, p. 261.
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"Oxide of iron and sulphide of lead, if they could be obtained in a state of fusion and subjected to a current, would conduct only so far as they are decomposed."
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3121. **Callan, N(icholas) J.** A brief account of an induction coil of great power in proportion to its length. (Philos. Mag., Ser. IV, Vol. 17, pp. 332-334.) 8vo. *London, 1859*
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Mathematical paper on the distribution of electric charge.
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Light is due to transverse vibrations but heat is held to be the result of "the mechanical action of the direct vibrations."
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3126. **Dove**, (Heinrich Wilhelm). (1803-1879.) On the difference presented by the prismatic spectrum of the electric light in vacuo at the positive and negative poles. (Philos. Mag. Ser. IV, Vol. 17, pp. 79-80.) 8vo. *London, 1859*
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Remarks on the Trevelyan experiment and on Gore's circular railway and ball. Dynamical actions of current.
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On the conductivity of glass; the author suggests two forms of electric conductivity.
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- 3131bis. **Grove**, (Sir) William Robert. (1811-1896.) On the electrical discharge, and its stratified appearance in rarefied media. (Proc. Roy. Instit., Great Britain, Vol. 3, pp. 5-10.) 8vo. *London, 1859*
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General phenomena observed in signaling through cables; cause of failure

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- 3133.—On a new form of telegraph cable intended to reduce the effects of inductive action. (Philos. Mag. Ser. IV, Vol. 17, pp. 334-345.) 8vo. *London, 1859*
Series of experiments made with Leyden jars which seem to justify the author's proposed modifications in the construction of submarine cables.
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3136. Isaacs. Urinal in Mount Pleasant. (Holborn Journ. 1859.) 8vo. (Newspaper article.) *Holborn, 1859*
The first self-flushing urinal; patented by Latimer Clark.
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Experiments to determine the absolute resistance of gutta-percha and the effect of temperature on its insulation resistance.
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Instruments and methods of making the observations; declination, horizontal force and dip.
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Note on a method of fixing iron filings on paper.
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- 3142.—On the spectra in highly rarefied gases of different kinds during the passage of the electric discharge. (*Philos. Mag., Ser. IV, Vol. 18, pp. 7-20.*) 8vo. *London, 1859*
Important contribution to the physics of the vacuum tube.
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3143. **Quet**, (Jean Antoine) (1810-1884) & (Marc. Aimé) **Seguin**. (1786-1875.) Stratification of the electric light. (*Philos. Mag., Ser. IV, Vol. 17, pp. 447-449.*) 8vo. *London, 1859*
From the *Comptes rendus*, Febr. 14, 1859.
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3144. **Robinson**, T(homas) R(omney). (1792-1882.) On stratification of electric light. (*Philos. Mag., Ser. IV, Vol. 17, pp. 269-274*) 8vo. *London, 1859*
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Description of magnetometers: magnetic elements for Rome, 1859.
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3148. **Sédillot**, L(ouis Pierre Eugène Amélie). (1808-1875.) Deuxième lettre à M. de Humboldt sur quelques points de l'histoire de l'astronomie et des mathématiques chez les orientaux. 29 pp. 8vo. *Paris, 1859*
Origin of arithmetical symbols.
3149. **Stewart**, Balfour. (1828-1887.) On some results of the magnetic survey of Scotland in 1857-1858. (Report, British Ass. Adv. Sc., 1859, pp. 167-190.) 1 map. 8vo. *London, 1859*
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The apparatus consisted chiefly of a hollow conductor supported on a glass rod kept dry by sulphuric acid.
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3158. **"Londoner."** A telegraph half-way to America; why is it not used? 24 pp. 8vo. *London, 1859*
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Rubber and gutta-percha as insulating materials; specific gravity and cables. The author had twenty-eight years experience in the manufacture and application of India-rubber and gutta-percha.
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Numerous tables of determinations made together with some theoretical considerations.

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 —See also 3033.
3197. **Montigny**, Ch(arles Marie Valentin). (1819-1890.) Note sur la vitesse du bruit du tonnerre. (Bull. Acad. Sc., Belgique, Ser. II, Vol. 9, pp. 36-46.) 8vo. *Brussels, 1860*
 From certain instances, the author infers that sounds due to a sudden, violent disturbance, *e. g.*, a pistol shot, are propagated with greater velocity than those due to the human voice or a musical instrument. The conclusion favors the views of Earnshaw.
 —See also 2245, 3357.
3198. **Newall**, R(obert) S(tirling). (1812-1899.) Observations on the present condition of Telegraphs in the Levant; with especial reference to the concession of the line between the Dardanelles and Alexandria, and to the convention between Austria and England with regard to the line between Ragusa and Egypt. 63 pp. 1 map. 8vo. *London, 1860*
 Means of establishing telegraphic communication between England, Egypt and India.
 —See also 2293.
3199. **Planté**, (Raimond Louis) Gaston. (1834-1889.) New secondary pile of great power. (Philos. Mag., Ser. IV, Vol. 19, pp. 468-469.) 8vo. *London, 1860*
 The lead storage battery, developed by Planté from the elementary form of Ritter.
 —See also 2162.
3200. **Quincke**, G(eorg Hermann). On a new kind of electric current. (Philos. Mag., Ser. IV, Vol. 19, pp. 455-458.) 8vo. *London, 1860*
 Currents due to forcing water through a clay plate.
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 The *modus operandi* of electricity in muscular motion.
 —See also 1605, 3700.
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 Spark discharge of an induction coil.
 —See also 913, 3251, 3312.

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3204. **Schneider**, Emile. Memoir on electric cables and sounding lines. 8 pp. 1 plate. 4to. (*London, 1860?*)
Defects of the Atlantic cable, p. 2.
3205. **Schnirch**, Fr. Die erste (dies- und jenseits des Oceans) ausgeführte Kettenbrücke fuer den Lokomotivbetrieb. 16 pp. 1 plate. 4to. *Vienna, 1860*
Bridge, across the Danube at Vienna.
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The proposed telegraphic route *via* the Faroe Islands, Iceland, Greenland and Labrador.
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3207. **Siemens**, (Ernst) Werner (1816-1892) & K(arl) W(ilhelm) (Sir Charles William) **Siemens**. (1822-1883.) On a new method of insulating submarine telegraph conductors with India rubber or its compounds. (Civil Engin. and Archit. Journ., Vol. 23, pp. 273-275.) 4to. *London, 1860*
Machinery for drawing tight the India-rubber covering on the wire so as to exclude atmospheric air.
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3208. **Stewart**, Balfour. (1828-1887.) An account of the construction of the self-recording magnetographs at the Kew Observatory. (Report, British Ass. Adv. Sc., 1860, pp. 200-228.) 3 plates. 8vo. *London, 1860*
Illustrated account of the instrument with details of the photographic processes used at the Kew Observatory.
—See also 3149.
3209. **Taylor**, J(ohn) W(illiam). Remarks on Greenland and its ice in reference to the Atlantic telegraph. With remarks to accompany the soundings of H. M. S. *Bulldog*. (Copy from MS.) 8+11 pp. Folio. (*London, 1860?*)
Suitability of the Greenland coast for landing the Atlantic cable.
3210. **Thomsen**, (Hans Peter Jorgen) Julius. A constant copper-carbon battery. (Abstract.) (Philos. Mag., Ser. IV, Vol. 21, p. 80.) 8vo. *London, 1860*
The battery consisted of copper in dilute sulphuric acid and carbon in a mixture of bichromate of potash, sulphuric acid and water; the combination is theoretically interesting; the author was a noted investigator.
—See also 1628.
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The author's *absolute electrometer* was used in determining the *e. m. f.* of a battery.

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The electrostatic forces were determined by the absolute and portable electrometers of the author; the appendix contains numerous important definitions and considerations.
- 3213.—Notes on atmospheric electricity. (Philos. Mag., Ser. IV, Vol. 20, pp. 360-363.) 8vo. *London, 1860*
Observations made with the author's water-dropping collector; Beccaria's experiments on the electricity of the atmosphere.
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The author's experimental tube with which he showed that different gases intercept radiant heat in different degrees.
- 3215.—On the influence of magnetic force on the electric discharge. (Philos. Mag., Ser. IV, Vol. 19, pp. 238-242.) 8vo. *London, 1860*
Experiments illustrating the constitution of the electric discharge; battery of 400 Grove cells used; Gassiot's results with water battery of 3,500 cells.
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Results of experiments made with an exploring rod raised over the Physical Museum of the Roman University; abridged from the Comptes Rendus of July 16, 1860.
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Necessity of a careful survey for deep-sea cables.
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Advantages of the telegraphic project submitted.
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The author finds that the agreement known to exist between the thermal and the electrical conductivity of metals holds also for alloys.
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3222. The Atlantic cable. (*Nautical Mag.*, Vol. 29, pp. 337-355.) 8vo. *London, 1860*
The bed of the Atlantic; submarine volcanoes.
3223. Electric clocks.—Electricity for blasting in mines and quarries. — Electric light.—Electric weaving. — Electro-metallurgy. — Electro-motive engines.—Electro-plating and gilding iron. — Electro-sorting apparatus. — Electro-teleggraphy. — (*Ure's Dictionary of Arts*, Vol. 2, pp. 79-113.) 8vo. *London, 1860*
3224. Electricity and the electric telegraph. (*Cornhill Mag.*, Vol. 2, pp. 61-73.) 8vo. *London, 1860*
Review and discussion of electric discovery. *C. M. of the Scots Magazine*, 1753, said to be *Charles Marshall*, p. 66. (See No. 378.)
3225. Blair, George. Some results in electro-magnetism obtained with the balance galvanometer. (*Philos. Mag.*, Ser. IV, Vol. 21, pp. 311-314.) 8vo. *London, 1861*
The galvanometer was constructed to give an exact measure by weight of the deflective force which the current exerts upon the magnetic needle of the instrument.
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Application of the author's hydrodynamical theory to the explanation of magnetic phenomena.
- 3227.—On theories of magnetism and other forces in reply to remarks by Professor Maxwell. (*Philos. Mag.*, Ser. IV, Vol. 21, pp. 250-254) 8vo. *London, 1861*
The theory of Professor Challis is that physical forces are modes of action of the pressure of the ether which is a continuous fluid medium, having the property of pressing in proportion to its density, and filling all space not occupied by the discrete atoms of sensible bodies, which atoms are inert, spherical, and of different but constant magnitudes. (See No. 3247.)
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3228. Clark, (Josiah) Latimer. (1822-1898.) Circular announcing partnership with (Sir) Charles (Tilston) Bright. *1861*
- 3228a.—Circular announcing dissolution of the partnership. *1865*
- 3229.—On electrical quantity and intensity. (*Proc. Roy. Instit.*, Great Britain, Vol. 3, pp. 337-341.) 8vo. *London, 1861*
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3230. Croll, James. (1821-1890.) Remarks on Ampère's experiment in the repulsion of a rectilinear electrical current on itself. (*Philos. Mag.*, Ser. IV, Vol. 21, pp. 247-250; Vol. 23, pp. 365-367.) 8vo. *London, 1861-1862*
Considerations on the nature of the electric current. (See No. 3233.)
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London, 1861
3232. **Fleury**, A. L. Description of new magneto-electric machines. (Journ. Franklin Instit., Vol. 72, pp. 418-424.) 8vo
Philadelphia, 1861
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3233. **Forbes**, J(ames) D(avid). (1809-1868.) Note respecting Ampère's experiment on the repulsion of a rectilinear electrical current on itself. (Philos. Mag., Ser. IV, Vol. 21, pp. 81-86.) 1 plate. 8vo. (See No. 3230.)
London, 1861
—See also 2680.
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Note on the propagation of an electric current through a submarine cable.
—See also 3129.
3235. **Gore**, George. Preliminary note on the production of vibrations and musical sounds by electrolysis. (Philos. Mag., Ser. IV, Vol. 22, p. 555.) 8vo.
London, 1861
If a large quantity of electricity is made to pass through a suitable electrolyte into a small surface of pure mercury, strong vibrations will occur.
- 3235a.—On the production of vibrations and sounds by electrolysis. (Philos. Mag., Ser. IV, Vol. 24, pp. 401-402.) 8vo.
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The author considers the vibrations to have an electro-chemical origin resulting from an attraction between the mercury of the negative electrode and the mercury of the electrolyte.
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3236. **Guillemin**, C(laude) M(arie). (1822-1890.) Note sur le nombre maximum de signaux télégraphiques élémentaires qu'on peut transmettre, dans un temps donné, au moyen de l'appareil Morse. (Extract, Ann. Télégr., Ser. II, Vol. 4.) 4 pp. 8vo.
Paris, 1861
A few instances of rapid telegraphic transmission.
—See also 3184.
3237. **Jenkin**, (Henry Charles) Fleeming. (1833-1885.) On the insulating properties of gutta-percha. (Philos. Mag., Ser. IV, Vol. 21, pp. 75-79.) 8vo.
London, 1861
Tables and formulæ by which the resistance of a new cable coated with gutta-percha may be approximately estimated.
—See also 3137.
3238. **Lloyd**, Humphrey. (1800-1881.) On earth-currents, and their connexion with the diurnal changes of the horizontal mag-

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netic needle. (Philos. Trans. Roy. Soc., 1861, pp. 115-141.) 2 plates. 4to. *London, 1861*

The author endeavors to show that the diurnal variation of the horizontal magnetic needle is due to electric currents traversing the crust of the earth; bibliography of the subject.

- 3238a.—On earth-currents and their connexion with the phenomena of magnetism. (Philos. Mag., Ser. IV, Vol. 22, pp. 437-442.) 8vo. *London, 1861*

The author, a distinguished investigator of terrestrial magnetic phenomena, gives reasons for his convictions that all changes of terrestrial magnetism both periodic and irregular can be explained by earth-currents.

- 3238b.—(The same paper.) (Proc. Roy. Irish Acad., Vol. 8, pp. 313-318.) 1 plate. 8vo. *Dublin, 1861*

- 3238c.—On earth-currents in connexion with magnetic disturbances. (Proc. Roy. Irish Acad., Vol. 8, pp. 392-396.) 8vo. *Dublin, 1862*

—See also 2726.

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The experiments were made with Leyden batteries; they gave indications of the oscillatory character of the discharges.

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The experiments showed that the green-coloring matter develops favorably under the influence of the electric (arc) light.

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—See also 1024.

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The cable proposed for the Red Sea, p. 16.

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Four qualities that an alloy for a standard of resistance should fulfil; gold-silver alloy recommended.
- 3245a.—(The same paper.) A reprint. *London, 1861*
- 3246.—Some remarks on Dr. Siemens's paper "On Standards of electrical resistance and on the influence of temperature on the resistance of metals. (Philos. Mag., Ser. IV, Vol. 22, pp. 195-202.) 8vo. *London, 1861*
Degree of accuracy in absolute measurements of resistance. (See No. 3258.)
—See also 3033.
3247. **Maxwell**, J(ames) C(lerk). (1831-1879.) The theory of molecular vortices applied to electric currents. (Philos. Mag., Ser. IV, Vol. 21, pp. 281-291+338-348.) 1 plate. 8vo. *London, 1861*
A mathematical paper; lines of force indicate the direction of *minimum pressure* at every point of the medium. (See No. 3227.)
—See also 3034.
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Inquiry into the theory and construction of telegraph relays.
—See also 3467, 3607.
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3250. **Riess**, P(eter Theophil). (1804-1883.) On electrical partial discharges. (Philos. Mag., Ser. IV, Vol. 21, pp. 542-543.) 8vo. *London, 1861*
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—See also 862, 2639, 2651, 3412.
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Experiments showing retardation of the discharge of Leyden jars due to resistances in the discharge-circuit; Wheatstone criticized.
—See also 3202.
3252. **Romanoff**, D. Telegraphic communication between Europe, America, China, Japan, and the East Indies, via Siberia. (Morning Post, Oct. 3, 1861.) 15 pp. 8vo. *London, 1861*
The route recommended is "a safer and better one than through the wild steppes of Asia Minor and Persia," p. 15.

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For reproduction of letter (which should have been entered in Vol. I), see No. 731.
—See also 2534.
3254. **Sabine**, (Sir) Edward. (1788-1883.) On the laws of the phenomena of larger disturbances of magnetic declination in the Kew Observatory; with notices of the progress of our knowledge regarding the magnetic storms. (*Philos. Mag., Ser. IV, Vol. 22, pp. 310-324.*) 8vo. *London, 1861*
The disturbances referred to were recorded at Kew in 1858 and 1859.
- 3255.—On the lunar-diurnal variation of the magnetic declination obtained from the Kew Photograms in 1858, 1859 and 1860. (*Proc. Roy. Soc., Vol. II, pp. 73-80.*) 8vo. *London, 1861*
It is inferred that the moon causes a small variation in each of the magnetic elements having a double period in every lunar day.
- 3255a.—(The same paper.) (*Philos. Mag., Ser. IV, Vol. 22, pp. 479-484.*) 8vo. *London, 1861*
- 3256.—On the secular change in the magnetic dip in London between the years 1821 and 1862. (*Proc. Roy. Soc., Vol. II, pp. 144-162.*) 8vo. *London, 1861*
"The regularity and uniformity with which the secular magnetic changes continue through long intervals of time together with their sudden periodic reversals wear the aspect of effects of some yet unascertained cosmical cause," p. 162.
- 3256a.—(The same paper.) Abstract. (*Philos. Mag., Ser. IV, Vol. 23, pp. 223-238.*) 8vo. *London, 1862*
—See also 2544.
3257. **Siemens**, (Sir) C(harles) W(illiam). (1822-1883.) Description of a machine for covering telegraph wires with India-rubber. (*Proc. Instit. Mechan. Engin., 1860, pp. 137-146.*) 4 plates. 8vo. *London, 1861*
Specific inductive capacity of gutta-percha and India-rubber; general remarks on materials used for insulation.
- 3258.—A new resistance thermometer. (*Philos. Mag., Ser. IV, Vol. 21, pp. 73-74.*) 8vo. *London, 1861*
The thermometer is based on the fact that the conductivity of a copper wire increases in a simple ratio as its temperature decreases. (See No. 3246.)
—See also 3107.
3259. **Siemens**, (Ernst) Werner. (1816-1892.) Proposal for a new reproducible standard measure of resistance to galvanic currents. (*Philos. Mag., Ser. IV, Vol. 21, pp. 25-38.*) 1 plate. 8vo. *London, 1861*
A prism of mercury one meter long and one millimeter in section at 0°. C. proposed as the unit of resistance.
—See also 1214, 3207, 3472, 3518, 3564, 3845, 4161.
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1859, as recorded by photography at the Kew Observatory.
(Philos. Trans. Roy. Soc., 1861, pp. 423-430.) 3 plates. 4to.
London, 1861

The auroral display was one of unprecedented magnificence; it was widely observed and was accompanied with violent and excessive disturbances of terrestrial magnetism.

- 3260a.—(The same paper.) Abstract. (Philos. Mag., Ser. IV, Vol. 24, pp. 315-317.) 8vo. *London, 1862*
—See also 3149.

3261. **Stoney, G(eorge) Johnstone.** On the amount of the direct magnetic effect of the sun or moon on instruments at the earth's surface. (Philos. Mag., Ser. IV, Vol. 22, pp. 294-299.) 8vo. *London, 1861*
"Though the sun or moon were as highly magnetized as the earth, their direct effects would be so small as to be masked by the more powerful, unknown perturbing causes which the observations prove to be at work."
—See also 3323, 3770.

3262. **Tate, Thomas (Turner).** (1807-1888.) On a new electrometer (The Siphon Electrometer) for measuring the electrical charge of the prime conductor of a machine; and on dispersion of different liquids by electrical action. (Philos. Mag., Ser. IV, Vol. 21, pp. 452-457.) 8vo. *London, 1861*
This *Siphon electrometer* is based on the principle that different quantities of electricity discharge different quantities of liquid from a siphon tube in which the said liquid is held by capillary action.
—See also 1302.

3263. **Thomson, (Sir) William.** (Lord Kelvin.) (1824-1907.) On the secular cooling of the earth. (Trans. Roy. Soc. Edinburgh, Vol. 23, pp. 157-169.) 1 plate. 4to. *Edinburgh, 1861*
"The chief object of the present communication is to estimate from the known general increase of temperature in the earth downwards and the date of the first establishment of that *consistenter status* which, according to Leibnitz's theory is the initial date of all geological history."

- 3264.—On the measurement of electric resistance. (Proc. Roy. Soc., Vol. 11, pp. 313-329.) 8vo. *London, 1861*
"Bridge" measurement of resistance with method of avoiding sensible error arising from uncertainty of connections.

- 3264a.—(The same paper.) (Philos. Mag., Ser. IV, Vol. 24, pp. 149-162.) 8vo. *London, 1862*
—See also 2946.

3265. **Thomson, (Sir) William (Lord Kelvin)** (1824-1907) and (Henry Charles) **Fleeming Jenkin.** (1833-1885.) On the true and false discharge of a coiled electric cable. (Philos. Mag., Ser. IV, Vol. 22, pp. 202-211.) 8vo. *London, 1861*
Polarization of earth-plates found to be very small; experiments with cables.
—See also 2946, 3137.

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Alcohols and oils subjected to current from batteries of 900 cells.

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New York, 1861
The induction coil used for lighting a number of gas jets.
—See also 991 bis, 3569.
3268. **Vinchent, J(ulien).** (1822-1887.) Situation des lignes télégraphiques Belges en Janvier 1861, résumé des opérations en 1860. (Extract, Ann. des Trav. Publ., Belgique, Vol. 18.) 30 pp. 8vo.
Brussels, 1861
—See also 1305, 3422.
3269. **Walker, Charles V(incent).** (1811-1882.) On magnetic storms and earth currents. (Philos. Trans. Roy. Soc., 1861, pp. 89-131.) 3 plates. 4to. *London, 1861*
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- 3269a.—(The same paper.) (Proc. Roy. Soc., Vol. 11, pp. 105-111.) 8vo. *London, 1861*
—See also 2811.
3270. **Weber, Wilhelm (Eduard).** (1804-1891.) On the measurement of electric resistance according to an absolute standard. (Philos. Mag., Ser. IV, Vol. 22, pp. 226-240+261-269.) 8vo.
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—See also 2785.
3271. **West, C(harles).** (1816-1898.) A lecture on submarine telegraphy. 16 pp. 8vo. *London, 1861*
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—See also 1472.
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Criticism of a formula for the strength of current derived from the indications of a tangent galvanometer.
—See also 5852.
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3274. **Ocean telegraphy.** (Edinb. Review, 1861, pp. 113-143.) 8vo. *Edinburgh, 1861*
General history of telegraphy; the physics of a deep-sea cable.
3275. **Abria, (Jérémie Joseph Benoit).** (1811-1892.) Sur les lois de l'induction électrique dans les plaques épaisses. (Ann. Chim. et Phys., Ser. III, Vol. 65, pp. 257-316.) 1 plate. 8vo. *Paris, 1862*
Electric induction through thick insulators.
—See also 2774.

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Electrically operated brakes.
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- 3278.—On the difference in the magnetic properties of hot rolled and cold rolled malleable iron, as regards the power of receiving and retaining induced magnetism of superpermanent character. (Philos. Trans. Roy. Soc., 1862, pp. 273-288.) 4to. London, 1862
Experiments showing that cold-rolled bars lose less magnetism spontaneously than hot-rolled bars.
—See also 2750.
3279. **Allan, Thomas.** Transatlantic telegraph. (Morning Chronicle, January 11, 1862.) Folio. London, 1862
Letter criticizing the construction of the Atlantic and existing deep-sea cables.
—See also 1377, 4553, 4583, 5537, 5565.
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The automatic mechanism of the Serrin lamp.
—See also 2564, 2898.
3281. **Caselli, (Giovanni).** (1815-1891.) Specimens de transmission télégraphique par le système de M. Caselli. 1862
Specimens of despatches sent by the Caselli writing telegraph.
3282. **Clark, (Josiah) Latimer.** (1822-1898.) Diary from January 9th to March 18th, 1862. 103 pp. 1862
The diary refers to Latimer Clark's connection with the "Malta and Alexandria and Telegraph to India Company."
—See also 2897.
3283. **Croll, James.** (1821-1890.) Ampèrian repulsion. (Philos. Mag., Ser. IV, Vol. 24, p. 326.) 8vo. London, 1862
Note on the self-repulsion of a rectilinear current. (See No. 3327.)
—See also 3230.
3284. **D'Abbadie, Antoine (Thompson).** (1810-1897.) Sur le tonnerre en Ethiopie. (Mém. Instit. France, Savans Etrangers, Vol. 16, pp. 1-158.) 4to. Paris, 1862
Observations made by the author on electric storms during a long sojourn in Ethiopia.
3285. **De la Rive, A(uguste Arthur).** (1801-1873.) Further researches on the aurorae boreales and the phenomena which attend them. (Philos. Mag., Ser. IV, Vol. 23, pp. 546-553.) 8vo. London, 1862
—See also 2627.

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3287. **Dumas**, (Jean Baptiste) and (Jean René) **Benoit**. Mode of applying the electric light for mining purposes. (*Philos. Mag., Ser. IV, Vol. 24, p. 408.*) 8vo. *London, 1862*
Vacuum tubes recommended for lighting mines.
—See also 1854, 3778.
3288. **Fitz Roy**, (Robert) (also **Fitzroy**). (1805–1865.) An explanation of the meteorological telegraphy, and its basis now under trial at the Board of Trade. (*Philos. Mag., Ser. IV, Vol. 24, pp. 395–457.*) 8vo. *London, 1862*
General considerations on air-currents, storms, and weather forecasts.
—See also 1569.
3289. **Gassiot**, John P(eter). (1797–1877.) Experimental investigations on the stratified appearance in electrical discharges. Effect obtained by varying the resistance. (*Proc. Roy. Soc., Vol. 12, pp. 329–340.*) 2 plates. 8vo. *London, 1862*
One of the author's classic papers on the stratified discharge. Reference to the water-battery of 3,520 cells.
- 3290.—On the heat which is developed at the poles of a voltaic battery during the passage of luminous discharges in air and in vacuo. (*Philos. Mag., Ser. IV, Vol. 24, pp. 225–229.*) 8vo. *London, 1862*
—See also 2819.
3291. **Gaugain**, J(ean) M(othée). (1811–1880.) Note on the theory of spherical condensers. (*Philos. Mag., Ser. IV, Vol. 23, pp. 245–248.*) 8vo. *London, 1862*
Electric charge of a spherical condenser; experimental confirmation of theory.
- 3292.—Note on the limit of the charge of condensers. (*Philos. Mag., Ser. IV, Vol. 24, pp. 495–496.*) 8vo. *London, 1862*
The author's conclusion is: that solid insulators, submitted to the influence of electricity, behave exactly like metals, and that inductive capacity is not distinct from conductivity.
—See also 3129.
3293. **Gherardi**, S(ilvestro). (1802–1879.) Sul magnetismo polare di Palazzi ed altri edifizii in Torino. (*Mem. Accad. Sc. Bologna, Vol. 12, pp. 515–546.*) 4to. *Bologna, 1862*
Magnetic disturbances due to certain palaces and other buildings.
—See also 3130.
3294. **Gore**, George. Electro-deposition. (*Practical Mechanic's Journ., Vol. 7, pp. 546–551.*) Folio. *London, 1862*
Historical sketch.
—See also 3022.
3295. **Harris**, (Sir) W(illiam) S(now). (1792–1867.) On some new phenomena of residuary charge and the law of exploding distance of electrical accumulation on coated glass. (*Philos. Mag., Ser. IV, Vol. 23, pp. 484–492.*) 8vo. *London, 1862*
The object of the paper is to prove that the residual charge of a Leyden jar is not the result of electrical penetration within the glass.
—See also 2556.

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3296. **Jenkin**, (Henry Charles) Fleeming. (1833-1885.) Experimental researches on the transmission of electric signals through submarine cables. Part I. Laws of transmission through various lengths of one cable. (Philos. Trans. Roy. Soc., 1862, pp. 987-1017.) 3 plates. 4to. *London, 1862*
Rate of transmission varies inversely as the square of the length; the *e. m. f.* of the battery has no appreciable effect on the velocity with which the current is transmitted; increase in resistance of the dielectric due to electric absorption rather than to any real change in the conductivity of the material.
- 3296a.—(The same paper.) Abstract. (Philos. Mag., Ser. IV, Vol. 23, pp. 483-486.) 8vo. *London, 1863*
- 3297.—On the construction of submarine telegraph cables. (Excerpt Minutes Proc. Instit. Mechan. Engin., 1862, pp. 211-241.) 6 plates. 8vo. *Birmingham, 1862*
Relative advantages of India-rubber and gutta-percha; construction of different deep-sea cables.
—See also 3137.
3298. **Joule**, J(ames) P(rescott). (1818-1889.) On the probable cause of electrical storms. (Philos. Mag., Ser. IV, Vol. 23, pp. 334-335.) 8vo. *London, 1862*
"It seems not unreasonable to consider the formation of hail as essential to great electrical storms."
—See also 2918.
3299. **Lamont**, J(ohann) von. (1805-1879.) On the most advantageous form of magnets. (Philos. Mag., Ser. IV, Vol. 22, pp. 369-376.) 1 plate. 8vo. *London, 1862*
That form of magnet is considered most advantageous which unites the greatest magnetic moment with the smallest mass and smallest moment of inertia.
- 3300.—Connexion between earthquakes and magnetic disturbances. (Philos. Mag., Ser. IV, Vol. 23, p. 59.) 8vo. *London, 1862*
Magnetic disturbances observed on December 26, 1861, accompanying an earthquake which occurred in Greece.
—See also 2803.
3301. **Loomis**, Elias. (1811-1889.) On electrical currents circulating near the earth's surface, and their connection with the phenomena of the aurora polaris. (Amer. Journ. Sc. & Arts, Ser. II, Vol. 34, pp. 34-46.) 8vo. *New Haven, 1862*
Direction of earth-currents and motion of auroral rays.
—See also 2866.
3302. **Marié-Davy**, (Edme Hippolyte). (1820-1893.) On the conductivity of saline solutions. (Philos. Mag., Ser. IV, Vol. 23, pp. 79-80.) 8vo. *London, 1862*
Conductivity of solutions of copper sulphate.
- 3303.—On the electromotive force of voltaic piles. (Philos. Mag., Ser. IV, Vol. 24, pp. 76-78.) 8vo. *London, 1862*
Smee's cell: influence of air dissolved in the acidulated water, degree of acidity, temperature, etc.
—See also 1182.

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3304. **Matteucci, C(arlo).** (1811-1868.) On the secondary electro-motor power of nerves, and its application to the explanation of certain electro-physiological phenomena. (Philos. Mag., Ser. IV, Vol. 24, pp. 311-315.) 8vo. *London, 1862*
Improvements introduced by the author in instruments for electro-physiological research.
—See also 2728.
3305. **Matthiessen, A(ugustus)** (1831-1870) and **M(oritz) von Bose.** On some gold-tin alloys. (Philos. Mag., Ser. IV, Vol. 24, pp. 320-322.) 8vo. *London, 1862*
- 3306.—On the influence of temperature on the electric conducting power of the metals. (Philos. Mag., Ser. IV, Vol. 24, pp. 405-406.) 8vo. *London, 1862*
The authors find that "All pure metals in a solid state vary in conducting power to the same extent between 0° and 100° C."
—See also 3033.
3307. **Matthiessen, A(ugustus)** (1831-1870), and **(Karl Christoph) Vogt.** (1817-1895.) On the influence of traces of foreign metals on the electric conducting power of mercury. (Philos. Mag., Ser. IV, Vol. 23, pp. 171-179.) 8vo. *London, 1862*
The qualitative results given refer to zinc, tin, lead, and bismuth; peculiar behavior of mercury when alloyed with traces of other metals. (See No. 3315.)
- 3307a.—Reply to R. Sabine's "Remarks on the influence of traces of foreign metals on the electric conducting power of mercury." (Philos. Mag., Ser. IV, Vol. 24, pp. 30-37.) 8vo. *London, 1862*
Rejection of the hypothesis that "the conducting power of a fluid mixture is in proportion to the conducting power of the two metals in their fluid state at the same temperature." (See No. 3315.)
—See also 3033, 3404.
3308. **Maxwell, J(ames) C(lerk).** (1831-1879.) The theory of molecular vortices applied to statical electricity. (Philos. Mag., Ser. IV, Vol. 23, pp. 12-24.) 8vo. *London, 1862*
Mathematical treatment of the subject; according to the author, the particles which form the partitions between the vortex cells constitute the *matter* of electricity.
- 3309.—The theory of molecular vortices applied to the action of magnetism on polarized light. (Philos. Mag., Ser. IV, Vol. 23, pp. 85-95.) 8vo. *London, 1862*
The connection between magnetism and electricity has the same mathematical form as that between certain pairs of phenomena, of which one has a linear and the other a rotary character.
—See also 3034.
3310. **Moigno, F(rançois Napoléon Marie)** (Abbé). (1804-1884.) Machine magnéto-électrique de la compagnie l'Alliance exposée par August Berlioz. 11 pp. ill. 8vo. (*Paris, 1862?*)
—See also 1161, 2910.

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3311. Paalzow, (Carl Adolph). (1824-1908.) On magnetizing steel needles by the current of a Leyden jar. (Philos. Mag., Ser. IV, Vol. 24, pp. 494-495.) 8vo. London, 1862
—See also 3514.
3312. Rijke, P(ieter) L(eonhard). (1812-1901.) On some properties of the induced current. (Philos. Mag., Ser. IV, Vol. 24, pp. 249-262.) 8vo. London, 1862
The primary current of an induction coil broken in the middle of a flame in order to increase the length of spark.
—See also 3202.
3313. Robinson, T(homas) R(omney). (1792-1882.) On the spectra of electric light as modified by the nature of the electrodes and the media of discharge. (Philos. Trans. Roy. Soc., 1862, pp. 939-986.) 4to. London, 1862
The author worked with spark-spectra; he remarks that though the "electric" spectrum may give useful indications to the analyst, it should not be trusted without full knowledge of the conditions which may affect its indications.
- 3313a.—(The same paper.) Abstract. (Philos. Mag., Ser. IV, Vol. 25, pp. 486-488.) 8vo. London, 1863
—See also 3144.
3314. Sabine, (Sir) Edward. (1788-1883.) Notices of some conclusions derived from the photographic records of the Kew declinometer in 1858, 1859, 1860 and 1861. (Philos. Mag., Ser. IV, Vol. 24, pp. 542-546.) 8vo. London, 1862
The discussion of the observations confirm two important conclusions, concerning magnetic disturbances: a) their periodicity and b) the coincidence of their period with the sun-spot cycle.
—See also 2544.
3315. Sabine, Robert. (1837-1884.) Some remarks on a paper by A. Matthiessen and C. Vogt, "On the influence of traces of foreign metals on the electric conducting power of mercury." (Philos. Mag., Ser. IV, Vol. 23, pp. 457-460.) 8vo. London, 1862
Matthiessen criticized for taking into account the conductivity of metals in the solid state in calculations of fluid amalgam resistances. (See No. 3307.)
—See also 1698, 3364, 3648, 3761, 3840, 3968, 4240.
3316. Selwyn, J. H. Explanation of the floating cylinders for laying telegraphic submarine cables. 18 pp. 1 plate. 8vo. London, (1862)
3317. Siemens, (Sir) Charles William. (1822-1883.) Electrical instruments and telegraphic apparatus. (Practical Mechanic's Journ., 1862, pp. 529-546.) ill. 4to. London, 1862
Some industrial applications of the electric current.
—See also 3107.

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3318. **Smith**, Archibald (1813-1872) and (Sir) Frederic John Owen **Evans**. (1816-1886.) On the effect produced on the deviation of the compass by the length and arrangement of the compass needle; and on a new mode of correcting the quadrantal deviation. (Philos. Mag., Ser. IV, Vol. 23, pp. 149-151.) 8vo.
London, 1862
Use of correcting-magnets and soft-iron correctors for ships' compasses.
—See also 1702, 3444, 3543.
3319. **Sprye**. Commerce with Western China. 8 papers. 4to.
1862-1864
3320. **Sprye**, Richard, and R. H. F. **Sprye**. Aerial telegraph to Hong-Kong and the open ports of China, and a new commerce with the vast west of that empire, across Eastern-Pegue, from Rangoon. 35 pp. 1 map. 8vo.
London, 1862
- 3321.—The Western-Inland-Provinces of China proper, geographically and commercially considered in connection with British Eastern-Pegue, and the port of Rangoon. 63 pp. 1 map. 8vo.
London, 1862
3322. **Stokes**, G(eorg) G(abriel). (1819-1903.) On the long spectrum of electric light. (Philos. Trans. Roy. Soc., 1862, pp. 599-619.) 4to.
London, 1862
Spark spectra of metals; spectrum of the electric arc; effect of the size, form and nature of the electrodes.
- 3322a.—(The same paper.) (Philos. Mag., Ser. IV, Vol. 25, pp. 310-311.) 8vo.
London, 1863
3323. **Stoney**, G(eorge) Johnstone. Note on the correction for the length of the needle in tangent-galvanometers. (Philos. Mag., Ser. IV, Vol. 23, pp. 345-347.) 8vo.
London, 1862
Formula for the strength of a current derived from the deflection of a tangent galvanometer when the length of the magnet is taken into account.
—See also 3261.
3324. **Tait**, Peter (Guthrie) (1831-1900), and J(ames) A(lfred) **Wanklyn**. Note on the electricity developed during evaporation and during effervescence from chemical action. (Philos. Mag., Ser. IV, Vol. 23, pp. 494-496.) 8vo.
London, 1862
Friction considered to be the main cause of the development of electricity in evaporation.
—See also 3650.
3325. **V . . .**, L. L. Application de la télégraphie électrique aux usages domestiques. (Revue Gén. Architect. et Trav. Publ., Vol. 19, 1-42.) ill. 8vo.
Paris, 1862
Batteries and electric bells.
3326. **Breda**, (Jacques Jacob Gisb. Sam.) van. (1788-1867.) Remarks on Ampère's experiment on the repulsion of a rectilinear electrical current on itself. (Philos. Mag., Ser. IV, Vol. 23, pp. 140-145.) 8vo.
London, 1862

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3327. **Breda**, (Jacques Jacob Gisb. Sam.) van (1788-1867) and W(illiam) M(artinus) **Logeman**. On Ampèrian repulsion. (Philos. Mag., Ser. IV, Vol. 24, pp. 126-127.) 8vo. *London, 1862*
Brief reply to James Croll's criticisms. (See No. 3283.)
3328. **Walker**, Charles V(incent). (1811-1882.) On magnetic calms and earth-currents. (Philos. Trans. Roy. Soc., 1862, pp. 203-219.) 4to. *London, 1862*
Currents of electricity are at all times moving in definite directions in the earth and their direction is not determined by local causes.
- 3328a.—(The same paper.) Abstract. (Proc. Roy. Soc., 1862.) 6 pp. 8vo. *London, 1862*
—See also 2811.
3329. **Wiedemann**, G(ustav) H(einrich). (1826-1899.) Ueber elektrische Beleuchtung. (Handbuch der Chem. Technologie, Vol. I, pp. 151-172.) ill. 8vo. *Berlin, 1862*
Electric lighting, for the general reader.
—See also 3219.
3330. **Long-sea telegraphs**. (All the Year Round, 1862, pp. 9-12+38-44.) 8vo. *London, 1862*
Paper of general historical and technical information.
3331. **Die Wunderleistungen des Telegraphen**. (Didaskalia, No. 129, May 10, 1862.) 4to. *Frankfort, 1862*
Popular note on the achievements of the electric telegraph.
3332. **Airy**, (Sir) G(eorge) B(iddell). (1801-1892.) On the strains in the interior of beams. (Philos. Trans. Roy. Soc., 1863, pp. 49-71.) 3 plates. 4to. *London, 1863*
- 3333.—First analysis of one hundred and seventy-seven magnetic storms registered by the magnetic instruments in the Royal Observatory, Greenwich, from 1841 to 1857. (Philos. Trans. Roy. Soc., 1863, pp. 617-648.) 4to. *London, 1863*
Numerical value and analysis of the photograms registered.
—See also 2750.
3334. **Bache**, A(lexander) D(allas). (1806-1867.) Records and results of a magnetic survey of Pennsylvania and parts of adjacent states in 1840 and 1841 with some additional records and results of 1834-1835, 1843 and 1862. (Smithsonian Contributions to Knowledge.) 82 pp. 4to. *Washington, 1863*
The observations comprised declination, dip and total force.
—See also 2700.
3335. **Callan**, N(icholas) J. On an induction coil of great power, and on the effects of connecting plates with the ends of the secondary coil. (Philos. Mag., Ser. IV, Vol. 25, pp. 413-417.) 8vo. *London, 1863*
Father Callan was among the earliest investigators of the theory and phenomena of the induction coil.
—See also 2859.

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3336. **Cazin, A**(chille Auguste). (1832-1877.) On a method of varying the tension of the discharge of an electric battery, and of a Ruhmkorff's coil. (Philos. Mag., Ser. IV, Vol. 25, pp. 410-411.) 8vo. *London, 1863*
The discharge of Leyden battery.
- 3337.—Mémoire sur l'évaluation en unités de poids des actions électrodynamiques. (Ann. Chim. et Phys., Ser. IV, Vol. 1, pp. 257-276.) 1 plate. 8vo. *Paris, 1863*
The author's electrodynamic balance.
—See also 2228, 3598, 3644, 3718, 3775.
3338. **Challis, J**(ames). (1803-1882.) On Newton's foundation of all philosophy. (Philos. Mag., Ser. IV, Vol. 26, pp. 280-292.) 8vo. *London, 1863*
Discussion of the characteristics and mutual relations of the theoretical and experimental departments of natural philosophy.
—See also 3123.
3339. **Chambers, Charles**. (1834-1896.) On the nature of the sun's magnetic action upon the earth. (Philos. Trans. Roy. Soc., 1863, pp. 503-516.) 3 plates. 4to. *London, 1863*
The author finds that no effect of the sun's action on a magnet is sensible at the distance of the earth. The direct and the induced magnetic action of the sun not the sole cause of the diurnal variations of the magnetic elements.
- 3339a.—(The same paper.) Abstract. (Philos. Mag., Ser. IV, Vol. 27, p. 384.) 8vo. *London, 1864*
—See also 3818.
3340. **Conte**. Rapport sur le percement du grand tunnel des Alpes. 51 pp. 4 plates. 8vo. *Paris, 1863*
The proposed tunnel under the Alps from Modena to Bardonnèche.
—See also 3388.
3341. **Coxworthy, Franklin**. (Memorial to the House of Commons concerning the author's dismissal as clerk of the Ordnance department.) 4 pp. 12mo. *London, 1863*
The memorialist is the author of a small work entitled "Electrical Condition."
—See also 2833.
3342. **De la Rive, Lucien**. On the electrical conductivity of thallium. (Philos. Mag., Ser. IV, Vol. 26, pp. 236-238.) 8vo. *London, 1863*
The paper shows how the author determined the density of thallium, the resistance of thallium wires and the temperature-coefficient.
3343. **Du Moncel, (Théodose Achille Louis)**. (1821-1884.) Description des télégraphes électro-chimiques de Caselli et Bonelli. (Pantélégraphe-Typo-télégraphie.) (Ann. Télégr., Vol. 6, pp. 209-245.) 1 plate. 8vo. *Paris, 1863*
Detailed notice of Caselli's and Bonelli's "writing" telegraph.
—See also 1223, 5363.

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3344. Ellis, William. Account of some experiments showing the change of rate produced in a clock by a particular case of magnetic action. (*Philos. Mag., Ser. IV, Vol. 325-331.*) 8vo. *London, 1863*
The paper shows how the rate of a clock may be changed without touching the pendulum-screw by merely adjusting a magnet.
—See also 3443, 4004, 4177, 4363.
3345. Findlay, Alexander G(eorge). (1812-1875.) Notes explanatory of a chart of the North Atlantic Ocean. Second edition, 16 pp., 1 map. (25x21 cm.) 8vo. *London, 1863*
These notes refer to the coasts, rocks and shoals, currents, general meteorology of the Atlantic; routes of steamships and sailing vessels.
3346. Gaugain, Jean M(othée). (1811-1880.) On the inductive capacity of insulating bodies. (*Philos. Mag., Ser. IV, Vol. 25, pp. 556-558.*) 8vo. *London, 1863*
Experiment on the time-effect on the charge of a condenser, made with coated panes of varying dimensions. The author holds that *induction* takes place by means of the ether, whereas *conduction* requires the presence of ponderable matter.
—See also 3129.
3347. Gore, George. On the properties of electro-deposited antimony. (*Philos. Mag., Ser. IV, Vol. 25, pp. 479, 480.*) 8vo. *London, 1863*
In this note the author describes two kinds of electrolytically deposited antimony possessing the property of evolving heat.
—See also 3022.
3348. Harris, (Sir) W(illiam) Snow. (1792-1867.) On the correct interpretation of the electrical terms intensity and tension. (*Philos. Mag., Ser. IV, Vol. 26, pp. 504-515.*) 1 plate. 8vo. *London, 1863*
Intensity is held to vary as the square of the quantity whilst tension varies as the first power of the quantity.
—See also 2556.
3349. Hearder, Jonathan N(ash). (1809-1876.) Imperfections in the present mode of fitting lightning conductors. 11 pp. 8vo. *London, 1863*
"It is impossible to draw an electrical spark from the conductor of an electrical machine without causing an electrical disturbance not only in every surface of the room but in every other room of the building," p. 10.
—See also 2916.
3350. Jenkin, (Henry Charles) Fleeming. (1833-1885.) On the construction of telegraphic lines. (A lecture.) 18 pp. 8vo. *London, 1863*
- 3350a.——On the maintenance and efficiency of telegraphic lines. (A lecture.) 18 pp. 8vo. *London, 1863*
—See also 3137.
3351. Magnus, (Heinrich) G(ustav). (1802-1870.) Ueber die Diathermansie trockner und feuchter Luft. (*Ann. Phys. und Chem., Vol. 118, pp. 575-588.*) 1 plate. 8vo. *Berlin, 1863*
Some disadvantages of the method employed by Professor Tyndall in his researches on the absorption of radiant heat by dry and by moist air.

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- 3351a.—(English translation.) On the diathermancy of dry and moist air. (Philos. Mag., Ser. IV, Vol. 26, pp. 21-30.) 1 plate. 8vo. *London, 1863*
—See also 3065.
3353. Matthiessen, A(ugustus) (1831-1870) and (Karl Christoph) Vogt. (1817-1895.) On the influence of temperature on the electric conducting power of thallium and iron. (Philos. Trans. Roy. Soc., 1863, pp. 369-383.) 4to. *London, 1863*
The paper contains a table of the conducting power of pure metals at 0° C; silver being 100°, that of thallium is 9.16°.
- 3353a.—(The same paper.) Abstract. (Proc. Roy. Soc., Vol. 12, pp. 472-475.) 8vo. *London, 1863*
- 3353b.—(The same paper.) Abstract. (Philos. Mag., Ser. IV, Vol. 26, pp. 542-545.) 8vo. *London, 1863*
- 3354.—Report on the chemical nature of alloys. (Report, British Ass. Adv. Sc., 1863, pp 38-48.) 1 plate. 8vo. *London, 1863*
Conducting power of alloys for heat and electricity.
—See also 3033, 3307, 3404.
3355. Mickle, John. On thermo-electrical currents from the condensation of vapor and the evaporation of water. (Philos. Mag., Ser. IV, Vol. 26, pp. 435, 436.) 8vo. *London, 1863*
3356. Miller, W(illiam) Allen. (1817-1870.) On the photographic transparency of various bodies, and on the photographic effects of metallic and other spectra obtained by means of the electric spark. (Philos. Mag., Ser. IV, Vol. 25, pp. 304-310.) 8vo. *London, 1863*
Notes on the spark-spectra of a number of metals.
—See also 1328.
3357. Montigny, Ch(arles Marie) Valentin. (1819-1890.) Note sur la résistance comparative des conducteurs de paratonnerres, de fer et de cuivre à la fusion par la foudre. (Bull. Acad. Sc., Belgique, Ser. II, Vol. 15, pp. 630-638.) 8vo. *Brussels, 1863*
Brief study of the liability to fusion of copper, iron and platinum points for lightning rods.
—See also 3197.
3358. Packe, Charles. Electric induction in the Pyrenees. (Philos. Mag., Ser. IV, Vol. 26, p. 160.) 8vo. *London, 1863*
Observations made at an altitude of 8,200 feet.
3359. Raoult, (François Marie). (1830-1901.) Researches on chemical heat and voltaic heat. (Philos. Mag., Ser. IV, Vol. 26, pp. 522-524.) 8vo. *London, 1863*
Normal phenomena observed in voltmeter.
—See also 1581, 3411.
3360. Reitlinger, (Edmund). (1830?-1882.) On the stratification of the electric light. (Philos. Mag., Ser. IV, Vol. 25, pp. 317, 318.) 8vo. *London, 1863*
Differences in spectra obtained by placing the broad and the constricted part of the tube in front of the slit of the spectroscope.

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- 3361.—Ueber die Quellen des Lichtes. 24 pp. 12mo. *Vienna, 1863*
 Tract of the source and theory of light.
 —See also 1464.
3362. Renard, N(icolas) A(imé). Théorie du magnétisme terrestre dans l'hypothèse d'un seul fluide électrique. (Mém. Acad. de Stanislas, 1863, pp. 25-98.) 8vo. *Nancy, 1863*
 The origin of terrestrial magnetism due to the double motion of the earth (translation and rotation) through the ether.
 —See also 1533.
3363. Sabine, (Sir) Edward. (1788-1883.) Results of the magnetic observations at the Kew observatory, from 1857 and 1858 to 1862 inclusive. (Philos. Trans. Roy. Soc., 1863, pp. 273-307.) 3 plates. 4to. *London, 1863*
 Discussion of the different magnetic variations and disturbances.
 —See also 2544.
3364. Sabine, Robert. (1837-1884.) On a new determination of mercury unit of electrical resistance in Dr. Siemens' laboratory. (Philos. Mag., Ser. IV, Vol. 25, pp. 161-174.) 8vo. *London, 1863*
 The mercury unit of resistance was reproduced 21 times in Dr. Siemens' laboratory viz. 6 times in the first determination, 5 times in the second, and 10 times in the one referred to in present paper.
 —See also 3315.
3365. Scoutetten, (Robert Joseph) H(enri). (1799-1871.) Électro-Physiologie. (Extract, Comptes rendus, Acad. Sc., Vol. 57.) 23 pp. 8vo. *Paris, 1863*
 Experiments devised by the author to show the development of electric currents by the contact of arterial and venous blood in the vessels of the animal system, these vessels serving as porous septa.
- 3366.—Expériences constatant l'électricité du sang chez les animaux vivants. (Answer to the letter of J. Béclard, M.D.) 8vo. *Metz, 1863*
 The author holds that the flow of blood through the veins and arteries is accompanied by an electric flux, due to resulting chemical reactions.
 —See also 1372, 3416.
3367. Siemens, (Sir) C(harles) W(illiam). (1822-1883.) Observations on the electrical resistance and electrification of some insulating materials under pressure up to 300 atmospheres. (Report, British Ass. Adv. Sc., 1863, pp. 688-694.) 8vo. *London, 1863*
 External pressure exercises a marked influence on the electrical condition of gutta-percha and India-rubber.
 —See also 3107.
3368. Smyth, Charles Piazzi. (1819-1900.) Astronomical observations made at the Royal Observatory, Edinburgh. (Edinburgh Astron. Observ., Vol. 12, pp. i-xiv+401-575.) 1 plate. 4to. *Edinburgh, 1863*
 The Teneriffe astronomical observations in 1856.
 —See also 3419.

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3369. **Stewart, Balfour.** (1828-1887.) On earth currents during magnetic calms, and their connection with magnetic changes. (Trans. Roy. Soc., Edinburgh, Vol. 23, pp. 355-370.) 4to. *Edinburgh, 1863*
Earth currents and changes in terrestrial magnetism.
- 3370.—On the forces concerned in producing the larger magnetic disturbances. (Philos. Mag., Ser. IV, Vol. 25, pp. 480-482.) 8vo. *London, 1863*
Arguments against the hypothesis that the peaks and hollows of the magnetograph-curves are due to the direct action of earth-currents on the magnets.
—See also 3149.
3371. **Thomson, (Sir) W(illiam) (Lord Kelvin.)** (1824-1907.) On the rigidity of the earth. (Philos. Trans. Roy. Soc., 1863, pp. 573-616.) 4to. *London, 1863*
The author expresses the opinion that the earth is solid throughout and more rigid than glass; the opinion is based on nutation, precession and certain tidal phenomena.
—See also 2946.
3372. **Varley, Cromwell F(leetwood).** (1828-1883.) Description of the translating apparatus and universal galvanometer. 8 pp., 5 plates. 8vo. *(London) 1863*
The description is illustrated with numerous diagrams.
- 3373.—On the relative speed of the electric wave through submarine cables of different lengths, and a unit of speed for comparing electric cables by bisecting the electric wave. (Philos. Mag., Ser. IV, Vol. 25, pp. 548-552.) 8vo. *London, 1863*
This research deals I. with the relative speed of electric wave through cables of various lengths; II. the retarding effect of the iron sheathing; III. with methods for the increase of the speed of the electric wave.
—See also 3427, 3486, 3567, 3573, 3615, 3675, 4254, 4425, 4597, 4636, 5324, 5353.
3374. **Verdet, M(arcel Emile).** (1824-1866.) De la dispersion des plans de polarisation des rayons de diverses couleurs. Recherches sur les propriétés optiques développées dans les corps transparents par l'action du magnétisme. (Ann. Chim. et Phys., Ser. III, Vol. 69, pp. 415-491.) 8vo. *Paris, 1863*
—See also 2925.
3375. **Walder, Erhard.** Ueber Wirkungsweise und Konstruktion der Blitzableiter. 9 pp. 4to. (Programm.) *Noerdlingen, 1863*
Syllabus of courses on electricity given in the agricultural and industrial school at Noerdlingen.
3376. **Wiesener, J.** On the magnetical deportment of some cyanogen compounds of iron, nickel and cobalt. (Philos. Mag., Ser. IV, Vol. 26, p. 238.) 8vo. *London, 1863*
3377. **Williamson, A(lexander) W(illiam).** On the dynamics of the galvanic battery. (Philos. Mag., Ser. IV, Vol. 26, pp. 452-462; Vol. 27, pp. 353-354.) 8vo. *London, 1863-1864*
—See also 3427, 3486, 3573.

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3378. Provisional report of the Committee on Electrical Standards: A(lexander William) Williamson, C(harles) Wheatstone, W(illiam) Thomson, W. H. Miller, A(ugustus) Matthiessen and (Henry Charles) Fleeming Jenkin. (Report, British Ass. Adv. Sc., 1862, pp. 125-135.) 8vo. *London, 1863*
—See also 3427, 3486, 3573.
3379. Contributions to a history of the Atlantic cable. (From the Electrician.) 19 pp. 8vo. *London, 1863*
Notes on the electrical condition of the Atlantic cable before and after it was laid.
3380. In memoriam: The late John Lewis Ricardo. 1 l. 8vo. *(London, 1863)*
Obituary notice of John Lewis Ricardo, founder of the Electric Telegraph Company. To him England owed in great measure the establishment of her commercial telegraph system.
3381. Airy, (Sir) George Biddell. (1801-1892.) On the diurnal inequalities of terrestrial magnetism, as deduced from observations, made at the Royal Observatory, Greenwich, from 1841-1857. (Philos. Mag., Ser. IV, Vol. 27, pp. 234-236.) 8vo. *London, 1864*
Diurnal inequalities in terrestrial magnetism exhibited in curves automatically recorded by instruments which were essentially the same during the period of 17 years, 1841-1857.
- 3381a.—On the diurnal and annual inequalities of terrestrial magnetism, as deduced from observations made at the Royal Observatory, Greenwich, from 1858-1863; being a continuation of a communication on the diurnal inequalities from 1841-1857, printed in the Philosophical Transactions, 1863. With a note on the luno-diurnal and other lunar inequalities, as deduced from observations extending from 1848 to 1863. (Philos. Trans. Roy. Soc., 1869, pp. 413-414,) 4 plates. 4to. *London, 1869*
Discussion of the photographic records of the various magnetometers.
—See also 2750.
3382. Akin, C. K. Notes principally on thermo-electric currents of the Ritterian species. (Philos. Mag., Ser. IV, Vol. 27, pp. 383-384.) 8vo. *London, 1864*
A mathematical paper; reference to thermo-electric inversion, discovered by Professor Cumming.
—See also 1636.
3383. Bradley, L(everett). On the anthistometer. (Trans. Amer. Instit.; Proc. Polytech. Ass., 1864, pp. 447-453.) 1 plate. 8vo. *New York, (1864?)*
The anthistometer, a measure of resistance.
- 3384.—(E. A.) Hill's battery. (Trans. Amer. Instit.; Proc. Polytech. Ass. (1864?), pp. 453-454.) 8vo. *New York, (1864?)*
In this battery there is no porous metal, the liquids being kept apart by their density.

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- 3385.—Galvanic batteries. Quantity and intensity currents. (Trans. Amer. Instit.; Proc. Polytech. Ass. (1864?), pp. 923-931.) 2 plates. 8vo. *New York, (1864?)*
 Distinction between quantity and intensity currents.
 —See also 1820, 3432, 3636.
3386. Chautard, J(ules Maria Augustin). Phenomena observed in the spectra produced by the light of induction-currents in traversing rarefied gases. (Philos. Mag., Ser. IV, Vol. 27, p. 408.) 8vo. *London, 1864*
 Spectra of hydrogen, nitrogen, carbonic acid and bromine.
 —See also 3531.
3387. Clark, (Josiah) Latimer. (1822-1898.) (Letter to Cyrus W(est) Field in reference to the Atlantic Cable of 1865.) *1864*
 —See also 2897.
- 3388.—Conte. Ecole Impériale des Ponts et Chaussées. Tunnel des Alpes. Conférences. 54 pp., 1 plate. 4to. *(Paris,) 1864*
 —See also 3340.
3389. Crookes, (Sir) William. The Atlantic cable and its teachings. (Quart. Journ. Sc., Vol. 1, pp. 44-53.) 8vo. *London, 1864*
 Historical notice of the cable of 1858.
 —See also 2420, 3496, 3821, 3994.
3390. Culley, R(ichard) S(pelman). On printing telegraphs. (Popul. Sc. Review, Vol. 3, pp. 293-303.) 8vo. *London, 1864*
 Abbé Caselli's writing telegraph with a number of specimens.
 —See also 1567, 4636.
3391. Debus, H(einrich). On the absorption and radiation of heat. (Popul. Sc. Review, Vol. 3, pp. 351-357.) 1 plate. 8vo. *London, 1864*
 Account of Tyndall's researches and results.
3392. De la Rive, (Auguste Arthur). (1801-1873.) W. Thomson's method for measuring electrical conductivity.—Application to fused metals. (Philos. Mag., Ser. IV, Vol. 27, pp. 77-80.) 8vo. *London, 1864*
 Conductivity of metals in the molten state.
 —See also 2627.
3393. Fairbairn, (Sir) William. (1789-1874.) On the construction and mechanical properties of submarine telegraph cables. (Quart. Sc. Review, Vol. 1, pp. 624-642.) 8vo. *London, 1864*
 Experiments to ascertain the insulating power of various substances proposed for cables.
3394. Gaugain, Jean M(othée). (1811-1880.) Note on the residual charge of electrical condensers. (Philos. Mag., Ser. IV, Vol. 28, pp. 76-78.) 8vo. *London, 1864*
 The author concludes that the *residual charge* of condensers does not depend on absorption by the dielectric.
 —See also 3129.

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3395. **Gilmore**, Arthur, and (Sir) W(illiam) H(enry) **Preece**. A new ships' steering electric telegraph. 24 pp. ill. pl. 16mo.
London, 1864
—See also 3556.
3396. **Gladstone**, J(ohn) H(all). (1827–1902.) Lighthouse illumination by magneto-electricity. (Quart. Journ. Sc., Vol. 1, pp. 70–75.) 8vo.
London, 1864
History, merits and demerits of the system.
—See also 3180.
3397. **Gore**, George. On the electrical relations of metals, etc., in fused substances. (Philos. Mag., Ser. IV, Vol. 27, pp. 446–451.) 8vo.
London, 1864
The most positive substances in fused salts are magnesium, aluminum and zinc; the most negative, platinum, gold, carbon and silver.
—See also 3022.
3398. **Header**, Jonathan N(ash). (1809–1876.) On a mode of preserving the iron plating of wooden ships from the corrosive action of sea water. 7 pp. 8vo.
(London,) 1864
The proposal is to attach a zinc band to the iron-plating which is kept a few inches from the copper-sheathing of the ship.
—See also 2916.
3399. **Hughes**, D(avid) E(dward). (1831–1900.) Expériences sur la forme et la nature des électro-aimants. (Ann. Télégr., 1864, pp. 1–11.) 2 plates. 8vo.
Paris, 1864
Curves of magnetization obtained from magnets of various forms.
—See also 1361, 4018, 4230, 4272.
3400. **Jochmann**, E(mil Carl Gustav Georg). (1833–1871.) On the electric currents induced by a magnet in a rotating conductor. (Philos. Mag., Ser. IV, Vol. 27, pp. 506–528.) 1 plate. 8vo.
London, 1864
Mathematical memoir on magnetism due to rotation.
- 3401.—On induction in a rotating conductor. (Philos. Mag., Ser. IV, Vol. 28, pp. 347–349.) 8vo.
London, 1864
Integration of equations connected with currents due to the rotation of a conductor in a magnetic field.
3402. **Johnston**, John. (1806–1879.) On the electrical properties of pyroxyline-paper and gun-cotton. (Philos. Mag., Ser. IV, Vol. 27, p. 240.) 8vo.
London, 1864
The author rubs sealing-wax, amber and sulphur with pyroxyline-paper and finds them to be *positively* electrified.
3403. **Malone**, T(homas) A. On the gas battery of Mr. Grove and its theory. (Philos. Mag., Ser. IV, Vol. 27, pp. 54–56.) 8vo.
London, 1864
The writer dissents from the accepted theory of the “gas” battery.
—See also 3066.
3404. **Matthiessen**, A(ugustus) (1831–1870) and K(arl Christoph) **Vogt** (1817–1895). On the influence of temperature on the

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electric conducting-power of alloys. (Philos. Trans. Roy. Soc., 1864, pp. 167-200.) 4to. *London, 1864*

Experimental data showing the influence of temperature on the conducting power of alloys composed of two and of three metals.

- 3404a.—(The same paper.) Abstract. (Philos. Mag., Ser. IV, Vol. 27, pp. 467-469.) 8vo. *London, 1864*

—See also 3033, 3307, 3353.

3405. **Mauritius, M.** On the variation of magnetic force with the temperature. (Philos. Mag., Ser. IV, Vol. 27, pp. 398-400.) 8vo. *London, 1864*

The author concludes from his experiments that the magnetic properties of iron are developed suddenly at a determinate temperature.

3406. **Napier, James (Robert).** (1821-1879.) On the dynamics of the galvanic battery. (Philos. Mag., Ser. IV, Vol. 27, pp. 52-54.) 8vo. *London, 1864*

Criticism on the ionic theory of electrolysis.

3407. **Norton, W(illiam) A(ugustus).** (1810-1883.) On molecular physics. (Philos. Mag., Ser. IV, Vol. 28, pp. 425-433; Vol. 30, pp. 276-289.) 8vo. *London, 1864-1865*

—See also 2872.

3408. **Plantamour, E(mile)** (1815-1882), and **A(dolph) Hirsch** (1830-1901). Détermination télégraphique de la différence de longitude entre les observations de Genève et de Neuchâtel. (Mém. Soc. Phys., Genève, Vol. 17, pp. 289-436.) 4 plates. 4to. *Geneva, 1864*

Description of the method used (with full numerical details), in determining the difference of longitude between the observatories of Geneva and Neuchâtel.

3409. **Plateau, J(oseph Antoine Ferdinand).** (1801-1883.) Sur un problème curieux de magnétisme. (Mém. Acad. Sc., Belgique, Vol. 34, pp. 1-37.) 4to. *Brussels, 1864*

The problem is: can an unsupported needle be maintained in stable equilibrium by the sole action of other magnets? The author was a very distinguished (Belgian) physicist.

3410. **Poggendorff, J(ohann) C(hristian).** (1796-1877.) On the extra current of the induction current. (Philos. Mag., Ser. IV, Vol. 28, pp. 1-8.) 8vo. *London, 1864*

—See also 2782.

3411. **Raoult, F(rançois) M(arie).** (1830-1901.) Researches into the thermal phenomena of voltameters, and measurements of the quantities of heat absorbed in electro-chemical decompositions. (Philos. Mag., Ser. IV, Vol. 28, pp. 551-554.) 8vo. *London, 1864*

"A voltameter introduced into circuit weakens the electro-motive force and thus destroys in the complete circuit a quantity of heat which is always greater than what is required for the decomposition effected."

—See also 3359.

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3412. **Riess**, P(eter Theophil). (1804-1883.) On the deflection of the magnetic needle by the secondary currents of the Leyden battery. (*Philos. Mag., Ser. IV, Vol. 27, pp. 313-316.*) 8vo.

London, 1864

The author describes a "powerful" means of imparting magnetism to a needle by using a Leyden battery.

—See also 3250.

3413. **Sabine**, (Sir) Edward. (1788-1883.) Results of hourly observations of the magnetic declination made by Sir Francis Leopold McClintock, and the officers of the yacht "Fox," at Port Kennedy, in the Arctic Sea, in the winter of 1858-1859; and a comparison of these results with those obtained by Captain Rochfort Maguire, and the officers of her Majesty's Ship "Plover," in 1852, 1853 and 1854, at Point Barrow. (*Philos. Trans. Roy. Soc., 1864, pp. 649-663.*) 1 plate. 4to.

London, 1864

Declinometer described; frequency of polar lights; solar-diurnal variation.

- 3414.—A comparison of the most notable disturbances of the magnetic declination in 1858 and 1859 at Kew and at Nertschinsk; preceded by a brief retrospective view of the progress of the investigation into the laws and causes of the magnetic disturbances. (*Philos. Trans. Roy. Soc., 1864, pp. 227-245.*) 4to.

London, 1864

Solar origin of the variations in terrestrial, magnetic phenomena; the decennial cycle.

—See also 2544.

3415. **Schmidt**, Gustav (Johann Leopold). (1826-1883.) *Graphische Darstellung des Ohm'schen Gesetzes.* 3 l. 8vo. *Leoben, 1864*
Graphs relating to the laws of Ohm and Joule.

3416. **Scoutetten**, (Robert Joseph) H(enri). (1799-1871.) *Expériences nouvelles pour l'électricité du sang.* (Extract, *Comptes rendus, Acad. Sc., Vol. 62.*) 20 pp. 8vo. *Paris, 1864*

Electro-physical paper in which the author attempts to measure the *e. m. f.* of the blood.

—See also 3365.

3417. **Secchi** (Angelo). (1818-1878.) On earth currents and their relation to electrical and magnetic phenomena. (*Philos. Mag., Ser. IV, Vol. 28, pp. 140-145.*) 8vo. *London, 1864*

Earth-currents observed on a line 52 kilometers in length, running from Rome to Anzio.

—See also 3147.

3418. **Selby**, W. B. Letter to W. P. Andrew on the importance and necessity of the establishment of the Euphrates route. 36 pp. 8vo. *London (1864)*

"If England is to hold her old place in the world, she must establish a railway by the Euphrates route," p. 6.

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3419. Smyth, C(harles) Piazzì. (1819-1900.) Report read to the special meeting of Her Majesty's government board of visitors of the Royal Observatory, Edinburgh, on the 4th of November, 1864. 10 pp. 4to. *Edinburgh, 1864*
The Great Pyramid and our standards of weight and measure.
—See also 3368.
3420. Soret, J(acques) L(ouis). (1827-1890.) Verification of the law of electrolysis when external work is performed by the galvanic current. (Philos. Mag., Ser. IV, Vol. 28, p. 563.) 8vo. *London, 1864*
Experiments made by the author which confirm the electrolytic law.
—See also 1430.
3421. Tomlinson, Charles. (1808-1897.) Experiments on the electrical fly. (Philos. Mag., Ser. IV, Vol. 27, pp. 202-218.) 1 plate. 8vo. *London, 1864*
The electrical fly, due to Hamilton of Dublin, affords a good illustration of the effect of points; the paper contains much important matter in connection with the electrical action of pointed conductors. Experiments with the "fly" in air, in rarefied air, in liquid dielectrics.
—See also 948.
3422. Vincent, J(ulien). (1822-1887.) Des lignes télégraphiques Belges en 1862 et 1863; situation, résultats et renseignements divers. 104 pp. 8vo. *(1864)*
- 3422a.—Mémoire sur les lignes télégraphiques du Royaume de Belgique. (Extract, Mém. Soc. Ingen. Civils.) 40 pp. L. 8vo. *Paris, 1864*
Telegraphic equipment in Belgium.
—See also 3268.
3423. Wallich, G(eorge) C(harles). (1815-1899.) The deep-sea bed of the Atlantic and its inhabitants. (Quart. Journ. Sc., Ser. I, Vol. 1, pp. 36-44.) 8vo. *London, 1864*
—See also 3217.
3424. Whipple, G(eorge) M(athews). (1842-1893.) Results of meteorological observations at the Kew Observatory. (Intellectual Observer, Vol. 6, pp. 52-57+246-251; Vol. 9, pp. 293-298; Vol. 13, pp. 47-52.) 1 plate. 8vo. *London, 1864-1868*
Daily observations and diagrams.
3425. Application of electricity to Railway purposes. (Railway Engin., Vol. 5, pp. 161-165.) ill. 4to. *London, 1864*
Short notice of the Weston dynamo and the Maxim lamp.
3426. Great electro-magnet.—Chester's electropoin battery. (Trans. Amer. Instit.; Proc. Polytech. Ass., 1864, pp. 347-348.) 1 plate. *New York, 1864*
A zinc-carbon battery.
3427. Report of the Committee appointed by the British Association on Standards of electrical resistance. (Sir Charles) Wheatstone, (Alexander William) Williamson, C(romwell) F(leetwood) Varley, (Sir William) Thomson, Balfour Stewart, (Sir

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Charles William) Siemens, A(ugustus) Matthiessen, (James Clerk) Maxwell, W. H. Miller, J(ames) P(rescott) Joule, (Henry Charles) Fleeming Jenkin, Esselbach, Sir (Charles) Bright.) (Report, British Ass. Adv. Sc., 1863, pp. 111-176.) 1 plate. 8vo.

London, 1864

This memorable report deals with the measurements of magnetic phenomena by their electromagnetic effects, and electric phenomena by their statical effects. Theory of the spinning coil by James Clerk Maxwell.

—See also 3378.

3428. **Toronto Magnetical Observatory.** Results of meteorological observations made during the years 1860, 1861 and 1862 at the Toronto Magnetical Observatory. xxiii+84 pp. 4to.

Toronto, 1864

The introduction contains general remarks on the work carried on in the Observatory, which was established in 1839.

3429. **Bacon, G. W.** Chart of the Atlantic telegraph, containing a history of telegraphy, origin and progress of the Atlantic telegraph, description of the old and new cables. 82 x 56 cm.

London (1865?)

Picturesque map showing the submergence of the Atlantic cable.

3430. **Bezold, W(ilhelm) von.** (1837-1907.) On the electrical behaviour of solid insulators. (Philos. Mag., Ser. IV, Vol. 30, pp. 181-184.) 8vo.

London, 1865

Note on dielectric absorption and residual discharge; "electrical movements can take place in the interior of insulators."

—See also 1482.

3431. **Blavier, E(douard) E(rneste).** (1826-1887.) Note sur la réponse de M. Guillemin aux observations de M. Gounelle. 45 pp. 8vo.

Nancy, 1865

Controversial paper on the "velocity of electricity" law of duration of the variable period.

—See also 1381, 4258, 4290.

3432. **Bradley, L(everett).** Bradley's new telegraph magnet. (Trans. Amer. Instit.; Proc. Polytech. Ass., 1865, pp. 511-513.) 8vo.

New York, 1865

Peculiarities and advantages claimed for the author's electro-magnet.

—See also 3383.

3433. **Bultinck, M.** Use of magnesium as electro-motor metal in voltaic elements. (Philos. Mag., Ser. IV, Vol. 30, p. 390.) 8vo.

London, 1865

3434. **Bunsen, R(ober) W(ilhelm).** (1811-1899.) On some thermo-electric piles of great activity. (Philos. Mag., Ser. IV, Vol. 29, pp. 159-162.) 8vo.

London, 1865

Inquiry into the generation of the electric current in thermo-electric batteries by the distinguished chemist and inventor of the Bunsen primary battery.

3435. **Burt, T. Seymour.** Observations for consideration previously to the laying of another Atlantic cable. (Journ. Soc. Arts, Vol. 14, pp. 87-88.) 8vo.

London, 1865

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3436. Chase, Pliny Earle. On numerical relations of gravity and magnetism. (Philos. Mag., Ser. IV, Vol. 30, pp. 52-57.) 8vo.
London, 1865
 Hansteen suspected and Sabine demonstrated the influence of the sun on terrestrial magnetism; the writer holds that all the phenomena of terrestrial magnetism result from tidal and thermal changes in terrestrial variation.
- 3436a.—(The same paper.) (Trans. Amer. Philos. Soc., Vol. 13, pp. 117-136.) 4to. *Philadelphia, 1869*
- 3437.—Influence of gravity on magnetic declination. (Philos. Mag., Ser. IV, Vol. 30, pp. 185-191.) 8vo. *London, 1865*
 The author finds a distinct connection between the daily and annual variations of terrestrial magnetism and gravitation.
- 3438.—On gravity and magnetic inclination. (Philos. Mag., Ser. IV, Vol. 30, pp. 329-336.) 8vo. *London, 1865*
 Some relations found by the author between gravitation-currents and magnetic dip.
3439. Clark, (Josiah) Latimer. (1822-1898.) (Letter to George Saward on the cable of 1865.) *1865*
 —See also 2897.
3440. Crace-Calvert, Frederick (1819-1873) and Richard Johnson (1810?-1881.) On the action of sea-water upon certain metals and alloys. (Extract, Journ. Soc. Arts, 1865.) 3 pp. 8vo. *London, 1865*
 The conclusion reached is: that iron is materially preserved from the action of sea-water when coated with zinc.
 —See also 3083.
3441. De la Rive, Auguste Arthur. (1801-1873.) Note on the propagation of electricity through metallic vapours produced by the voltaic arc. (Philos. Mag., Ser. IV, Vol. 29, pp. 553-554.) 8vo. *London, 1865*
- 3442.—On the optical properties developed in different kinds of glass by the passage of an electric discharge. (Philos. Mag., Ser. IV, Vol. 30, p. 180.) 8vo. *London, 1865*
 Note on the rotatory magnetic power of crown, flint and heavy (Faraday) glass.
 —See also 2627.
3443. Ellis, William. Lecture on the Greenwich system of time signals. (Horological Journ., Vol. 7, pp. 85-92+97-102+109-114+121-124.) 8vo. *London, 1865*
 Time signals are automatically transmitted from a clock in the Observatory at Greenwich to different centres of London whence they are distributed throughout the country.
 —See also 3344.
3444. Evans, (Sir) Frederic John (Owen) (1816-1886) and Archibald Smith (1813-1872). On the magnetic character of the armour-plated ships of the Royal Navy, and on the effect on

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the compass of particular arrangements of iron in a ship.
(Philos. Trans. Roy. Soc., 1865, pp. 263-323.) 2 plates. 4to.

London, 1865

Revision of the mathematical theory of the deviations of the compass and practical methods of compensation.

—See also 3318, 3543.

3445. Faraday, Michael. (1791-1867.) On the diamagnetic conditions of flame and gases (Philos. Mag., Ser. IV, Vol. 31, pp. 401-421.) 8vo. *London, 1865*

Account of Bancalar's discovery by Zantedeschi with remarks and confirmatory experiments by Faraday.

—See also 2549.

3446. Fernet, E(mile). Phenomenon in the induction-spark. (Philos. Mag., Ser. IV, Vol. 29, p. 550.) 8vo. *London, 1865*

Effect of heat on the path of spark from induction coil.

3447. Flight, Walter. (1845?-1885.) On the thermo-electric tension of minerals. (Philos. Mag., Ser. IV, Vol. 30, pp. 337-339.) 8vo. *London, 1865*

List of minerals used with results obtained.

3448. Gervais, Paul. Application of the electric light (Geissler's tubes) for lighting under water. (Philos. Mag., Ser. IV, Vol. 29, p. 55.) 8vo. *London, 1865*

Description of apparatus devised by the author and constructed by Ruhmkorff.

3449. Gisborne, Francis. Statistics of submarine telegraph cables to April, 1865. 4 l. Folio. *London, 1865*

Length, weight, depth and life of 68 submarine cables.

- 3449bis. Halse, W(illiam) H(oooper). On the extraordinary remedial efficacy of medical galvanism, when scientifically administered. 37 pp. 12mo. *London, (1865)*

Special ailments enumerated for which application of the electric current is effective.

3450. Hansteen, Chr(istopher). (1784-1873.) Observations de l'inclinaison magnétique, faites pendant les années 1855 à 1864 à l'observatoire de Christiania. (Extract, Bull. Acad. Belgique, Ser. II, Vol. 18.) 16 pp. 8vo. *(Brussels, 1865?)*

Tabulated observations of magnetic dip.

—See also 2575bis.

3451. Hearder, Jonathan N(ash). (1809-1876.) Some remarks on the cost of the light from magnesium as compared with other sources of illumination, with an account of some new inflammable and explosive compounds of magnesium. 3 pp. 8vo. *1865*

—See also 2916.

3452. Holtz, (Wilhelm Theodor Bernhard.) Ueber eine neue Elektrisirermaschine. (Ann. Phys. und Chem., Vol. 126, pp. 157-171.) 1 plate. 8vo. *Berlin, 1865*

A modified form of the Holtz machine.

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- 3452a.—(English translation.) On an electrical induction machine.
—On a new electrical machine. Translated by Prof. Poggen-
dorff. (Philos. Mag., Ser. IV, Vol. 30, pp. 159-160+425-433.)
1 plate. 8vo. *London, 1865*
—See also 1982.
3453. Hough, G. W. Automatic registering and printing barometer.
(Trans. Amer. Instit.; Proc. Polytech. Ass., 1865, pp. 460-
468.) 3 plates. 8vo. *New York, 1865*
3454. Jenkin, (Henry Charles) Fleeming. (1833-1885.) Letter ad-
dressed to the Editors of the Philosophical Magazine and
Journal on electrical standard. (Philos. Mag., Ser. IV, Vol.
29, p. 248.) 8vo. *London, 1865*
The author announces that the B. A. unit of resistance is ready for dis-
tribution.
- 3455.—On the retardation of electrical signals on land lines. (Philos.
Mag., Ser. IV, Vol. 29, pp. 409-421.) 1 plate. 8vo
London, 1865
The author applies to aerial lines the mathematical theory of electric trans-
mission through submarine cables.
- 3456.—Report on the new unit of electrical resistance proposed and
issued by the Committee on electrical standards appointed in
1861 by the British Association. (Philos. Mag., Ser. IV, Vol.
29, pp. 477-486.) 8vo. *London, 1865*
Meaning of the term *electrical resistance*; views held by early physicists;
table of relative values of various units.
- 3456a.—(The same paper.) (Proc. Roy. Soc., Vol. 14, pp. 154-164.)
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—See also 3137.
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- 3535.—Transport of a body by the voltaic current and by induction currents. (Philos. Mag., Ser. IV, Vol. 33, pp. 482-484.) 8vo.
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- 3538.—Michael Faraday; his life and works. (Philos. Mag., Ser. IV, Vol. 34, pp. 409-437.) 8vo.
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—See also 3129.

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—See also 4932.

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The paper deals with the *Peltier* and *Thomson* effects. (Autograph copy, dedicated to Mons. Balard.)
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The principle adopted is that the greater part of the path of each molecule of a gas is sensibly rectilinear and beyond the sphere of sensible action of neighboring molecules; this affords an explanation of various properties of gases.
- 3553.—*On the theory of the maintenance of electrical currents by mechanical work without the use of permanent magnets.* (Philos. Mag., Ser. IV, Vol. 33, pp. 474-478.) 8vo. *London, 1867*
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Remarks on the necessity of a standard wire-gauge.
3556. **Preece**, (Sir) William H(enry). *On the British Association unit for electrical measurements.* (Philos. Mag., Ser. IV, Vol. 33, pp. 397-398.) 8vo. *London, 1867*
A. B. unit of resistance.
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Electrodynamic actions of electric currents.

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London, 1867
 Practical observations on the construction of induction-coils for the purpose of increasing the heating power of the discharge.
- 3559a.—(The same paper.) (Philos. Mag., Ser. IV, Vol. 33, pp. 63-73.) 8vo.
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(London, 1867?)
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London, 1867
 Theory of the method proposed by the author, an electrician of ability.
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London, 1867
 This paper is remarkable for the introduction of the cumulative principle in the generation of powerful currents. The paper is dated Febr. 4, 1867, whilst that of Wheatstone announcing the same is dated Febr. 14. (See No. 3570.)
- 3562a.—(The same paper.) (Philos. Mag., Ser. IV, Vol. 33, pp. 469-471.) 8vo.
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- 3563.—On a resistance measurer. (Philos. Mag., Ser. IV, Vol. 34, pp. 270-273.) 8vo.
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 The instrument is said to be equal to the "bridge" in accuracy and range for measuring the resistance of electric conductors.
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London, 1867
 Experiments with water-drops and metallic filings falling through funnels (inductors) into insulated cans (receivers) thereby building up strong charges.
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Note on the author's electric brake for use on trains.
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The remarks refer principally to the employment of shunts.
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The problem relates to the alteration in the distribution of the tensions in a closed insulated circuit with one point connected to an insulated conductor.
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- 3570a.—(The same paper.) (Philos. Mag., Ser. IV, Vol. 33, pp. 471-474.) 8vo. *London, 1867*
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This document on the protection of powder-magazines against lightning is signed by Regnault, Pouillet, Fizeau and Becquerel.
3572. On the ignition of gunpowder by electricity. 14 pp. ill. Folio. *(London, 1867?)*
Three methods of firing powder: the voltaic battery, the magnetic exploder and the electric spark.
3573. Report of the Committee on Standards of Electrical Resistance. (Alexander Williams) Williamson, (Sir) C(harles) Wheatstone, (Sir) W(illiam) Thomson, W. H. Miller, A(ugustus) Matthiessen, (Henry Charles) Fleeming Jenkin, (Sir) Charles Bright, (James Clerk) Maxwell, (Sir) W(illiam) Siemens, Balfour Stewart, C(romwell) F(leetwood) Varley, G(eorge)

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London, 1868

Sir William Thomson on electrometer and Dr. Joule on the determination of the dynamical equivalent of heat from thermal effects of electric current.
 —See also 3378.

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London, 1868

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London, 1868
 Conduction in the arc is mainly effected by the transfer of material particles.
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 Practical deductions for use in the Royal Navy from numerous observations tabulated in the paper.
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- 3579.—Telegraphic communication with India. 16 pp. 1 map. 8vo.
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 —See also 4223, 5322.

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It is claimed that Volta by the invention of his battery may be considered the *father of electric telegraphy*.
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Suggestions for the use of seamen on the determination of the variation of the compass by circum-meridan altitudes of the sun and stars.
3586. Lovering, Joseph. I. Catalogue of auroras observed mostly at Cambridge after the year 1838. II. On the periodicity of the aurora borealis. (Mem. Amer. Acad. Sc., N. S., Vol. 10, pp. 1-351.) 4to. Cambridge, 1868
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Modified form of Poggendorff's compensation method.
- 3590a.—(English translation.) On a new method of determining the resistance of galvanic circuits. (Abstract.) (Philos. Mag., Ser. IV, Vol. 34, pp. 77-78.) 8vo. *London, 1867*
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Note on the author's "continuity test" between ship and shore.
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Resistance due to variations in battery combinations.
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—See also 3336.
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It is contended that the facts of magnetism "admit of explanation on the supposition that a single fluid (the ether) acts in a manner conformable to hydrodynamical principles."
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Extension of the paper read at the Dundee meeting of the British Association with numerous tables. (See No. 3532.)
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Note on the author's photometer.
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Note on the author's method of determining the horizontal component of the earth's magnetic force in absolute measure.
—See also 3548.
3604. **Kohlrausch, F**(riedrich Wilhelm Georg & W(ilhelm) A(ugust) Nippoldt. *Ueber die Gueltigkeit der Ohm'schen Gesetze fuer Elektrolyte und eine numerische Bestimmung des Leitungswiderstandes der verduennten Schwefelsaeure durch alternierende Stroeme.* (Ann. Phys. und Chem., Vol. 138, pp. 280-390.) 8vo. *Berlin, 1869*
Verification of Ohm's law for liquids, alternating current used.
—See also 3548.
3605. **L....., H. A.** Sub-marine telegraph cable to India and Australia considered as being the most direct, expeditious and secure line of communication, free from end to end of all

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- foreign political complications and compared with existing land lines. 25 pp. 1 map. 8vo. *London, 1869*
Difficulties of land lines compared with those of submarine cables.
3606. **Melsens**, (Louis Henri Frédéric). (1814-1886.) Notice sur le coup de foudre de la gare d'Anvers du 10 Juillet, 1865. (Bull. Acad. Sc., Belgique, Vol. 26.) 16 pp. (Incomplete.) 8vo. *Brussels, 1869*
The pamphlet contains a discussion of numerous cases of buildings struck by lightning.
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Note on a method of comparing the *e. m. f.* of batteries.
—See also 3248.
3608. **Moody**, John. Floating electric telegraph stations and light-ships for mid-ocean and the English and other channels. 8 pp. 1 plate. 8vo. *London, 1869*
"I am confident the mid-ocean and mid-channel stations would prove most remunerative."
3609. **Pepper**, John Henry. (1821-1900.) Some experiments with the great induction coil at the Royal Polytechnic. (Proc. Roy. Soc., Vol. 18, pp. 65-72.) 8vo. *London, 1869*
Details of construction of the great "Polytechnic" coil; the "flaming spark."
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3610. **Poggendorff**, (Johann Christian). (1796-1877.) Ueber eine Vereinfachung in der Konstruktion und dem Gebrauch der Holtz'schen Influenzmaschine erster Art. (Sitz. Ber. Akad. Wiss. Math. Nat. Kl., Vol. 59, pp. 322-332.) 8vo. *Berlin, 1869*
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—See also 2782.
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The observations were reduced by Mr. Whipple of the Kew Observatory.
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Reply to Professor Huxley; also origin and total amount of plutonic energy. (Autograph copy.)
—See also 2946.
3614. **V.....**, J. La nouvelle loi des télégraphes en Angleterre. (Extract, Ann. Trav. Publics, Belgique, Vol. 26.) 93 pp. 8vo. *Brussels, 1869*
Law authorizing the purchase of telegraph lines by the British Government.
—See also 3651.

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Illustration of the effects of the "electrification" of a cable.
- 3616.—Spiritualism. 1 p. Folio. (*London*), 1869
Letter on spiritualistic phenomena in general.
—See also 3372.
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The author investigates the *e. m. f.* of gas-batteries with electrodes of platinum and palladium.
—See also 3521.
3618. Electric Telegraph School of Instruction. Circular. 3 pp. 4to.
London, 1869
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London, 1869
Two general articles on the Cooke-Wheatstone controversy.
3620. (Persian Gulf Cable.) A log book and memoranda in writing. 1869
Operations connected with the submersion of the second Persian Gulf Cable, 1869, of which Latimer Clark was engineer-in-chief.
3621. The second Persian Gulf cable and Latimer Clark. (Bombay Gazette, Oct., 1869.) 1869
3622. The post-office telegraphs and how they will work. By an electrician. 32 pp. 12mo. *Edinburgh, 1869*
Acquisition of telegraphs by government; considerations on general economics.
3623. Stonyhurst College Observatory. Results of meteorological and magnetical observations for 1869. 30 pp. 1 table. 12mo.
Preston, 1869
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Letter by C. W. Siemens and Sir James Anderson.
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3626. Airy, (Sir) G(eorge) B(iddell). (1801-1892.) Note on an extension of the comparison of magnetic disturbances with magnetic effects inferred from observed terrestrial galvanic currents; and discussion of the magnetic effects inferred from

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the galvanic currents on days of tranquil magnetism. (Philos. Trans. Roy. Soc., 1870, pp. 215-226.) 1 plate. 4to.

London, 1870

Curves showing the diurnal inequalities of terrestrial magnetism.

—See also 2750.

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Electro-capillary phenomena.

3628.—Second mémoire: (The same subject.) (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 229-243.) 4to. Paris, 1870
Examples of the reduction of metals in capillary spaces.

3629.—Troisième mémoire: (The same subject.) (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 455-493.) 4to. Paris, 1870
Chemical effects due to electro-capillary action.

3630.—Quatrième mémoire: (The same subject.) (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 497-556.) 4to. Paris, 1870
Measurement of capillary spaces; apparatus illustrated.

3631.—Cinquième mémoire: Sur les phénomènes électro-capillaires comprenant les réductions métalliques dans les espaces capillaires l'endosmose, l'exosmose et la dialyse. (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 537-661.) 1 plate. 4to. Paris, 1870
Historical review of osmosis.

3632.—Sixième mémoire: Sur les phénomènes électro-capillaires, la formation des oxydes, des silicates, aluminates cristallisés et hydratés, et les effets de diffusion entre des liquides qui ne se mélangent pas. (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 663-681.) 4to. Paris, 1870
Some phenomena of dialysis.

3633.—Septième mémoire: Sur les phénomènes électro-capillaires. (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 756-824.) 4to. Paris, 1870

Electro-capillary currents in organic bodies; also electromotive force of liquids involved in electro-capillary phenomena.

3634.—Huitième mémoire: (The same subject.) (Mém. Acad. Sc. Instit. France, Vol. 36, pp. 825-947.) ill. 4to. Paris, 1870
Memoir on muscular currents and the nutrition of tissues.

—See also 2564.

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London, 1870

Refers to Captain Bolton's method of using the lime light or the electric light for military purposes.

—See also 3596.

3636. **Bradley**, L(everett). Aurora borealis. (Proc. Amer. Ass. Adv. Sc., Vol. 19, pp. 82-98.) 8vo. Salem, 1870

Discusses the origin and manifestations of atmospheric electricity, including the aurora borealis: written for the general reader.

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Influence of temperature. (Proof copy.)
—See also 3022.
3639. **Harder, Jonathan N(ash).** (1809-1876.) The degeneration of our sea fisheries. (Reprinted, Trans. Devonshire Ass. Adv. Sc.) 25 pp. 8vo. *Plymouth, 1870*
The author of this paper on sea-fisheries was an electrician of some distinction.
—See also 2916.
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A writing telegraph.
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Determination of insulation resistance of a telegraph line.
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3642. **Leitch, W.** Directions for the adjustment and use of the quadrant electrometer. 1 p. 1 plate. 8vo. *Glasgow, 1870*
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List of auroræ from 1739-1870; a second list extended from 1776-1872.
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- 3644a.—(The same paper.) (Mém. Sav. Etrang. Acad. Sc., Vol. 22, No. 3.) 50 pp. 1 plate. 4to. *Paris, 1873*
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Maps showing the isogonic, isoclinic and isodynamic lines for the epoch 1858-1868. Father Perry was assisted in his work by Father Sidgreaves, both of Stonyhurst College.
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The Dutch telegraph system: short history of electric telegraphy.
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Description of an aurora by various observers in different countries.
3655. **Biographical sketch of Rev. Dr. Peter Mark Roget**. (Proc. Roy. Soc., Vol. 18, pp. xxviii-xl.) 8vo. *London, 1870*
Roget's spiral; his *thesaurus*.
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3657. **Practical hints on the management of the compasses of iron and composite ships, with a new diagram and deviation curve**. 35 pp. ill. & 1 diagr. 8vo. *South Shields, 1870*
General information on the compass with practical instruction for determining the deviation.
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Map of great magnetic interest.
—See also 3543.
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to produce fluoride of iodine and a double salt composed of iodide of silver and fluoride of platinum.

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Abstract of a lecture.

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- 3667.—On the relations between chemical change, heat, and force, with a view to the economy of electro-dynamic engines. (Quart. Journ. Sc., Vol. I, pp. 77–99.) 8vo. London, 1871
Criticism of accepted views on the energy due to certain electrochemical combinations.

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- 3671.—On a method of fixing, photographing, and exhibiting the magnetic spectra. (Amer. Journ. Sc., Ser. III, Vol. I, pp. 263–266.) 8vo. New Haven, 1871

Note on author's method of "fixing" magnetic lines. (See No. 3677.)

—See also 3645.

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There are seven complete years for the observations of horizontal force and six for the vertical.

—See also 2544.

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The Maynooth battery.

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Submarine mines, mechanical and electrical.

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Capacity of platinum plates immersed in a solution of sulphuric acid and water. Suggested explanation of ball lightning.
- 3675a.—(The same paper.) Abstract. (*Proc. Roy. Soc.*, Vol. 19, pp. 236-246.) 8vo. *London, 1871*
—See also 3372.
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Thermopile for commercial purposes.
—See also 3475.
3677. **Electricity**. (*Quart. Journ. Sc.*, Vol. 1, pp. 427-432.) 8vo. *London, 1871*
Professor A. M. Mayer's method of fixing and photographing magnetic spectra (See No. 3671); Wheatstone's magneto-electric counter for registering number of revolutions of machinery.
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Experimental study of the distribution of magnetic power in the different parts of a steel magnet.
—See also 2750.
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Electro-capillary cells with constant current.
—See also 2564.
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—See also 3123.
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Abstract on the Clark's standard cell.
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3690. **Gore, George.** List of original scientific investigations, and papers on scientific subjects. 4 pp. 8vo. Birmingham, 1872
The list contains the titles and dates of publication of 75 papers by the author.
- 3690a.—List of (his) published books, papers, researches, etc. 4 pp. 8vo. London, 1873

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- 3691.—On the present position of science in relation to the British Government. 8 pp. 8vo. *Birmingham, 1872*
- 3692.—On the solvent power of liquid cyanogen. (Proc. Roy. Soc., Vol. 20, pp. 67-70.) 8vo. *London, 1872*
It is concluded that liquid cyanogen is remarkably inert and possesses but little solvent power.
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The *s. m. f.* of polarization.
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3695. Mayer, Alfred Marshall. The earth a great magnet. (University series, No. 9, pp. 213-284.) 1 plate. 12mo. *New Haven, 1872*
Lecture on general magnetic phenomena; numerous references to original works.
—See also 3645.
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The paper deals briefly with relevant historical matters.
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Table of the three magnetic elements for the 21 stations at which observations were made.
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The Gaussian constants refer to the magnetic potential of any point on the earth's surface.
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3699. Phillips, S(amuel) E. What is the atomic weight of indium? (Chemical News, Vol. 26, pp. 2-4.) 8vo. *London, 1872*
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3702. **Sabine, (Sir) Edward.** (1788-1883.) Contributions to terrestrial magnetism. No. 13. (Philos. Trans. Roy. Soc., 1872, pp. 353-433.) 3 plates. 4to. *London, 1872*
The magnetic elements for a great many places in high latitudes, being a contribution to terrestrial magnetism in furtherance of the work of Halley and Hansteen. (Autograph copy dedicated to Robert Willis.)
—See also 2544.
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The author's electrical pyrometer.
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Description of general systems of pneumatic transmission.
—See also 3107.
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Short communication on the aurora borealis, sun spots and magnetic disturbances.
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Note on the aurora borealis of Oct. 14, 1872.
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Machine useful for reductions of capacity, dielectric resistance, specific conductivity.
—See also 3591.
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A point in the theory of the frictional machine.
—See also 3111.
3709. **Whitehouse, E(dward) O(range) Wildman.** On a new hygrometer. (Quart. Journ. Meteorol. Soc., N. S. Vol. 1, pp. 63-69.) 4 plates. 8vo. *London, 1872*
Bulb wetted by contracted sulphuric acid as originally proposed by De la Rive in 1825.
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Instances showing that gas pipes and water pipes should be connected to the lightning conductor outside the building. (Autograph copy.)
—See also 3524.
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Note on some relations regarding electromagnetic spirals.
—See also 1850, 3807, 3898, 4054.
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A review of the two publications.
—See also 945, 1657.
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Magnetism acquired by the iron structure of the bridges due to the inductive action of the earth; hammering during the process of construction and vibration caused by passing train favored the acquisition of magnetism.
—See also 2750.
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List of Faraday's discoveries arranged chronologically.
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3715. **Becquerel, Antoine César.** (1788-1878.) Neuvième mémoire: Des moyens d'augmenter les effets des actions électro-capillaires dans les corps organisés. (Comptes rendus Acad. Sc., Vol. 38, pp. 313-326.) 4to. *Paris, 1873*
The circulation of the blood in connection with electro-capillary phenomena.
- 3716.—**Mémoire sur la décoloration des fleurs et des divers tissus végétaux par les décharges électriques et la chaleur.** (Mém. Acad. Sc., Vol. 38, pp. 185-230.) 4to. *Paris, 1873*
The transportation of material particles by the electric spark.
—See also 2564.
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Horary description of the aurora borealis of Febr. 4, 1872, as seen at Florence.
—See also 1441.
3718. **Cazin, A(chille Auguste).** (1832-1877.) Détermination expérimentale de la quantité de magnétisme d'un aimant ou d'un

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Determination of the strength of a magnet; causes of magnetism.

—See also 3336.

3719. **Clark, (Josiah) Latimer.** (1822-1898). On a common source of error in the measurement of currents of short duration when using galvanometers with shunts. (Journ. Soc. Electr. Engin., Vol. 2, pp. 16-29.) 8vo. *London, 1873*

Mr. Clark was one of the earliest electricians to call attention to the care with which measurements must be made when shunts are used; the paper is followed by a short notice of the author's *potentiometer*.

- 3720.—On the storms experienced by the submarine cable expedition in the Persian Gulf on November 1st and 2nd, 1869. (Quart. Journ. Meteorolog. Soc., 1873, pp. 117-119.) 8vo.

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Some curious phenomena observed during an electric storm.

—See also 2897.

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Note on the mechanical theory of electrolysis.

—See also 1862.

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Note on Clark's standard cell.

3723. **Gore, George.** On the preparation of inorganic carbon. (Reprinted, Chem. News, Vol. 6, p. 160.) 16mo. (*London, 1873?*)

- 3724.—On some properties of anhydrous liquefied ammonia. (Proc. Roy. Soc., Vol. 21, pp. 140-147.) 8vo. *London, 1873*

A study of the general solvent properties of liquid anhydrous ammonia.

—See also 3022.

3725. **Jekyll.** On telegraph poles. (Journ. Soc. Electr. Engin., Vol. 2, pp. 10-18.) 8vo. *London, 1873*

Means of supporting and strengthening telegraph poles subject to lateral strains.

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Manufacture and advantages of the iron pole known as the "Riband Telegraph Pole."

—See also 4397, 5840.

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Experiments on alloys of zinc and cadmium.

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Description of methods and statement of results.
—See also 3138.
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The *e. m. f.* of a battery of Daniell cells was measured directly in absolute electrostatic units by means of a Thomson's new absolute electrometer; its *e. m. f.* was also obtained in electromagnetic measure from the current produced in a circuit of known resistance; resulting value for v 29×10^9 centimetres per second.
3730. **Mallock, H.** On the block system of working on railways. (Journ. Soc. Electr. Engin., Vol. 2, pp. 10-23.) 8vo. *London, 1873*
The absolute and permissive block.
—See also 4443, 4639.
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On Faraday's lines of force.
—See also 3034.
3732. **Mayer, Alfred M(arshall).** On the effects of magnetization in changing the dimensions of iron, steel and bismuth bars. (Amer. Journ. Sc., Ser. III, Vol. 5, pp. 170-179.) 8vo. *New Haven, 1873*
Discussion of Joule's experiments.
—See also 3645.
3733. **Mignon et Rouart.** Sur les appareils pour la transmission pneumatique des dépêches. (Bull. Soc. d'Encourag. Industr., Ser. III, No. 28, pp. 1-18.) 2 plates, 1 plan. 4to. *Paris, 1873*
Pneumatic transmission: the author's system.
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Special reference to the London Metropolitan Railway and the Mont Cenis Tunnel.
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Venice, 1876
Some experiments on the thermoelectric properties of potassium and sodium: data and formulae.
- 3833.—Delle proprietà termoelettriche del sodio a varie temperature. (Atti Reale Instit. Veneto Sc., Ser. IV, Vol. 2, pp. 599-619.) 8vo. *Venice, 1876*
Thermo-electric power of certain metals.
3834. **Nipher, Francis E(ugene).** On a new form of lantern galvanometer. (Amer. Journ. Sc. and Arts, Ser. III, Vol. 11, pp. 111-114.) ill. 8vo. *New Haven, 1876*
Advantages of Barker's lantern galvanometer.
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The conclusion reached is that assaying by means of spectrum analysis is impracticable for the purpose of mint operations.
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The pamphlet deals with the manufacture and laying of a submarine cable. (Autograph copy.)
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Statistics of railway accidents.
- 3838.—The applications of electricity to the protection of life on railways. (Proc. Roy. Instit., Vol. 8, pp. 35-42.) 8vo.
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Telegraphy as a manufacturing industry.
- 3841.—On a method of measuring very small intervals of time. (Philos. Mag., Ser. V, Vol. 1, pp. 337-346.) 8vo. *London, 1876*
The interval is found from the leakage of a condenser.
- 3842.—On a method of measuring the contour of electric waves passing through telegraph lines. (Philos. Mag., Ser. V, Vol. 2, pp. 321-331.) 8vo. *London, 1876*
Method by which the electrical state of any point in a telegraph line may be examined quantitatively at intervals of $1/1000$ of a second after starting the electrical impulse.
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Capillary attraction not an electric phenomena; theory of the Lippmann capillary electrometer.
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Principle and use of the author's *bathometer*; the paper touches many practical points in the theory of gravitation.
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Note on an induction apparatus.
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3847. Thompson, S(ilvanus) P(hillips). On some phenomena of induced sparks. (Philos. Mag., Ser. V, Vol. 2, pp. 191-198.) 1 plate. 8vo. *London, 1876*
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Notes of Christmas lectures on frictional electricity.
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The work-value is enhanced by the surrounding case of soft-iron.
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General description of the Bell telephone with illustrations.
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Life and work of the English electrician.
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- 3864b.—(The same paper.) (Philos. Trans. Roy. Soc., Vol. 171, pp. 15-34.) 2 plates. 4to. London, 1880
Tables of potential-difference, given in volts for all the usual elements of voltaic batteries; Clark's cell used as standard of *e. m. f.*
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Inductive effects on telephone lines due to neighboring telegraph circuits.
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Theory of the engine-power motor and the electric-energy motor with diagrams.
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Diagram showing connections.
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A publisher's circular on the treatise.
- 4173.—Transit tables for 1882, giving the Greenwich mean time of the transit of the sun, and of certain stars, for every day in the year computed from the Nautical Almanac. 28 pp. 12mo. *London, 1882*
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- 4173a.—for 1883. 103 pp. 12mo. *London, 1883*
- 4173b.—for 1884. 67 pp. 12mo. *London, 1884*
- 4174.—View on the telephonic work of Reis, Gray, Varley, La Cour, Bell and Edison. 3 pp. Folio. (Proof-copy.) (1882)
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Directions for winding electro-magnets.
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The method is illustrated by the determination of the longitude of Cairo for use in the observation of the transit of Venus, 1874.
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Syllabus of the course.
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Electric lighting in theatres.
—See also 1675.
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4185. Maynard, Samuel. A commercial perpetual almanac and table for verifying dates. 1 p. L. 4to. *1882*
"I have found it (the Perpetual Almanac) perfectly correct in every instance," de Morgan.
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Construction of lightning conductors by the well-known Belgian electrician.
- 4187.—Paratonnerres. Notes et commentaires. (Extract, Recueil des Rapport des délégués Belges sur l'Exposition Internationale de Paris, 1881.) 134 pp. 8vo. *Brussels, 1882*
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Recent practical applications of the electric current with much general electric information.
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- 4195.—Electric energy. (Journ. Electr. Soc., Melbourne, Vol. 2, pp. 173-175.) 8vo. *Melbourne, 1882*
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- 4196.—The electromagnetic practical system of units. 7 pp. 8vo. *London, 1882*
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Description of trip (motor-boat) on the Thames; Jacobi's boat on the Neva propelled by an electromagnetic engine, 1839.
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General physiological action of the current.
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Description and use of author's secondary battery.
4210. New denomination of standards (of wire). 2 pp. Folio. (MS.) *1882*
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Experiments to determine which mode of winding a given length of wire on an iron bar gives the strongest electromagnet for the same current.
- 4213.—Note on the measurement of the electric resistance of liquids. (Philos. Mag., Ser. V, Vol. 16, pp. 132-142.) 1 plate. 8vo. *London, 1883*
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Beacon-fires, flash-lights, semaphores.
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4216. **Bramwell, (Sir) Frederick.** (1818-1903.) Telephones. (Institution of Civil Engineers, 2nd lecture.) 5 pp. 8vo. *London, 1883*
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4223. **Gisborne, F(rederick) N(ewton) (1821-1892) & Gust(av) Smith.** Dominion of Canada. Telegraph and Signal Service. Map No. III. (West-Central Section.) 92x132 cm. (Government. Telegraphic Service.) *Montreal, 1883*
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Notes on the principal practical units.
- 4226.—The development of electric lighting. (Journ. Soc. Arts, Vol. 31, pp. 778-787.) 4to. *London, 1883*
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4227. Gore, G(eorge). On the electrolysis of sulphate of copper. (Proc. Birmingham Philos. Soc., Vol. 3, pp. 24-80.) 8vo. *Birmingham, 1883*
Conditions connected with the transmission of currents through electrolytes.
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- 4229.—Peculiar absorption of a compound of iodine by aluminum. (Proc. Birmingham Philos. Soc., Vol. 4, pp. 66-68.) 8vo. *Birmingham, 1883*
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4231. Jewesbury, H. W. Short history of the introduction of gutta-percha into Europe. 15 pp. 1 plate. 8vo. *London, 1883*
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- 4234.—The progress of telegraphy. (Institution Civil Engineers, I. Lecture, 1883.) (Abstract.) 5 pp. 8vo. *London, 1883*
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- 4236.—The soaring of birds. (Nature, Vol. 27, pp. 534-535.) 8vo. *London, 1883*
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- 4237.—Distribution of energy in the spectrum. (Nature, Vol. 27, pp. 559-560.) 8vo. *London, 1883*
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- 4239.—Sur la mesure des forces électromotrices. (Cosmos-les Mondes, Ser. III, Vol. 6, pp. 535-540.) ill. 8vo. *Paris, 1883*
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The two systems based on the inch and the millimeter.
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Electric light and vegetation.
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4253. **Map of Manitoba, Alberta, etc.** (100x132 cm.) *Alberta, 1883*
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4255. **Airy, (Sir) G(eorge) B(iddell).** (1801-1892.) Results deduced from the measured terrestrial magnetic force in the horizontal plane at the Royal Observatory, Greenwich, from 1841-1876. 11 pp. 36 plates. 4to. (Greenwich Observations, Appendix, 1884.) *Greenwich, 1884*
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4262. **Clark, (Josiah) Latimer.** (1822-1898.) Manual of the transit instrument as used for obtaining correct time. 39 pp. ill.—Description, price lists and testimonials. 15 pp. ill. 12mo. *London, 1884*
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Numerous tables, formulae, etc.
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- 4270.—Synchronism. (Extract, Proc. Amer. Instit. Electr. Engin., Vol. 1.) 11 pp. 8vo. *New York, 1884*
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- 4271.—Synchronous-multiplex telegraphy in actual practice. (Journ. Franklin Instit., Vol. 118, pp. 161-172.) 8vo. *Philadelphia, 1884*
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Research on the physical changes that occur in iron and steel through annealing, tempering, etc.
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- 4277.—On the expression of electrical resistance in terms of a velocity. (Trans. St. Louis Acad. Sc., Vol. 4, pp. 535-536.) 8vo. *St. Louis, 1884*
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 Condemns the use of lightning rods. Discharging property of points said to have been discovered by Thomas Hopkinson, an American, in 1747, who communicated his discovery to Franklin. (Abstract of paper to be read at the Roy. Instit. of British Architects.)
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4282. **Rayleigh, (John William Strutt) & H. Sidgwick.** On the electro-chemical equivalent of silver and on the absolute electromotive force of Clark cells. (Philos. Trans. Roy. Soc., Vol. 175, pp. 411-460.) 1 plate. 4to. *London, 1884*
 Paper of historic as well as practical interest, suggestive of theory and methods of working.
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4283. **Sennett, Alfred Richard.** On the electric light. (Excerpt Minutes Proc. Instit. Civil Engin., 1884.) 25 pp. ill. 8vo. *London, 1884*
 Some points in the physics of the electric arc.
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4284. Wright, C(harles) R(omley) & C(harles) Thompson. On the determination of chemical affinity in terms of electro-motive force. (Proc. Physic. Soc., Vol. 5, pp. 257-283.) 8vo.
London, 1884
Permanency of the Clark cell.
4285. Comparison of the numbers and sizes of the new legal standard wire gauge with previously known numbers and sizes of the Birmingham wire gauge with their values in 1000ths of an inch. 1 p. Folio.
Leeds, 1884
4286. Curiosities of the electric light. (Chambers' Journ., 1884, pp. 140-143.) 4to.
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Article on the qualities of the arc and the incandescent light.
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New York, 1884
Pamphlet of general remarks on Faure's secondary battery.
4288. Lightning conductors. (Edinburgh Rev., Vol. 160, pp. 32-62.) 8vo.
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Historical review; practical application to date; with list of contemporary works on the subject.
4289. (Sketch of the career of Edward Davy, with note on his telegraph inventions.) (Electrician, Vol. 12, pp. 196-197.) Folio.
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4290. Blavier, E(douard) E(rneste). (1826-1887.) Influence des orages sur les lignes souterraines. (Ann. Télégr., Vol. 12, pp. 177-182.) 8vo.
London, 1884
The author finds that when the "ground" is good, underground electric conductors are not influenced by charged clouds, thunderstorms, etc. The same applies to submarine cables. (Autograph copy.)
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4291. Bottomley, J(ames) T(homson). On the electric resistance of a new alloy named platinoid. (Proc. Roy. Soc., Vol. 38, pp. 340-344.) 8vo.
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Platinoid is German silver with a small percentage of tungsten; it is but little affected by changes of temperature.
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London, 1885
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4293. Forrest, James. "The electrical regulation of the speed of steam engines and other motors for driving dynamos" by Mr. P. W. Williams. (Paper to be read at the seventeenth ordinary meeting of the Institute of Civil Engineers.) 1 p. 8vo.
London, 1885

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General considerations on the photometry of intense sources of light.
4295. Hopkinson, John. (1849-1898.) Magnetisation of iron. (Philos. Trans. Roy. Soc., 1885. pp. 455-469.) 7 plates. 4to. *London, 1885*
This important contribution to our knowledge of the behavior of iron under magnetizing forces is illustrated by tables of results, plotted curves, etc.
—See also 3877.
4296. Houston, (Edwin) J(ames). The electrical determination of the velocity of projectiles. (Journ. Franklin Instit., Ser. III, Vol. 90, pp. 134-146.) ill. 8vo. *Philadelphia, 1885*
Details of an electro-ballistic pendulum; various chronographs.
- 4297.—Delany's system of facsimile telegraphy. (Journ. Franklin Instit., Ser. III, Vol. 90, pp. 438-448.) ill. 8vo. *Philadelphia, 1885*
—See also 4269.
4298. Imray, John. High speed motors. (Excerpt, Minutes Proc. Instit. Civil Engin.) 19 pp. 8vo. *London, 1885*
General principles discussed, diagrams and formulae.
4299. Kapp, Gisbert. Modern continuous-current, dynamo-electric machines and their engines. (Excerpt, Minutes Proc. Instit. Civil Engin.) 31 pp. 2 plates. 8vo. *London, 1885*
Lengthy paper containing theoretical and practical considerations.
—See also 2411, 4345.
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The question discussed is "whether it is the human voice one hears in the telephone;" discussion by Lord Rayleigh, Prof. Ryan and Dr. M. F. O'Reilly.
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An electrical governor for engines used in electric installations.
4302. Perkins, Charles A. On the variation of the magnetic permeability of nickel at different temperatures. (Amer. Journ. Sc. Ser. III, Vol. 30, pp. 218-231.) 8vo. *New Haven, 1885*
Original experiments compared with those of previous investigators.
4303. Rayleigh, (John William Strutt). On the Clark cell as a standard of electro-motive force. (Philos. Trans. Roy. Soc., 1885, pp. 781-800.) 4to. *London, 1885*
"The result of a large experience is very favorable to the trustworthiness of the cells, if reasonable precautions be observed in charging them," p. 781.
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Washington, etc., 1885-1891

Two papers on the relation between the voltage, current, candle-power and efficiency of incandescent lamps. Other papers describe electrical apparatus designed and constructed for naval purposes.

4305. **Gore, G(eorge).** A new solution for electro-deposition of metals. (Proc. Birmingham Philos. Soc., Vol. 5, pp. 34-35.) 8vo.

Birmingham, 1886

The liquid employed was "asparagine."

—See also 3022.

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Philadelphia, 1886

Philipp Reis, the inventor of the articulating telephone.

—See also 4269.

4307. **Kohlrausch, Friedrich (Wilhelm Georg) & Wilhelm Kohlrausch.** Das elektrochemische Aequivalent des Silbers; zugleich eine experimentelle Pruefung erdmagnetischer Intensitaetsmessungen. (Ann. Phys. Chem., New Ser., Vol. 27, pp. 1-59.) ill. 8vo.

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Details of the research on the electrochemical equivalent of silver, 1886.

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4308. **Nipher, Francis E(ugene).** Report on magnetic determinations in Missouri, summer of 1878-1879. (Trans. St. Louis Acad. Sc., Vol. 4, pp. 81-101+121-144.) 1 plate. 8vo. *St. Louis, 1886*

Measurements of declination, dip, and horizontal force.

- 4309.—On certain problems in refraction. (Trans. St. Louis Acad. Sc., Vol. 4, pp. 325-350.) ill. 8vo. *St. Louis, 1886*

Notes of a magnetic survey of the State of Missouri.

- 4310.—On a property of the isentropic curve for a perfect gas as drawn upon the thermodynamic surface of pressure, volume, and temperature. Also, Magnetic survey of Missouri, IV., annual report. (Trans. St. Louis Acad. Sc., Vol. 4, pp. 407-410.) 8vo. *St. Louis, 1886*

Equation of thermodynamic surface and its development.

—See also 3834.

4311. **Perry, John.** Telpherage, a lecture delivered at the London Institution, Jan. 24, 1886. 50 pp. ill. pl. 8vo. *London, 1886*

History and practice of automatic transportation with numerous illustrations. (Autograph copy.)

—See also 3791.

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It is claimed that M. Jobard of Brussels was the first to express (1838) the idea that a carbon filament in vacuo would emit light when traversed by a current.
4313. **School of Submarine Telegraphy and Electrical Engineering,** London. 24 pp. ill. pl. 4to. *London, 1886*
Paper by William Lant Carpenter on electrical engineering as a profession and how to prepare for it.
- 4313a.—(The same paper.) 4to. *London, 1888*
4314. **Cuttriss, Charles.** Recent improvements in apparatus for ocean cabling. (Trans. Amer. Instit. Electr. Engin., Vol. 5, pp. 7-21; Discussion on the paper, Vol. 5, pp. 25-34.) 8vo. *New York, 1887*
4315. **Gore, G(eorge).** Relations of "Transfer-resistance" to the molecular weight and chemical composition of electrolytes. (Proc. Birmingham Philos. Soc., Vol. 5, pp. 426-484.) 8vo. *Birmingham, 1887*
The phenomenon termed "transfer-resistance" appears to be related to the atomic weights of the constituents of the electrolyte.
—See also 3022.
4316. **Hopkinson, Edward.** Electrical tramways; the Bessbrook and Newry tramway, with an abstract of the discussion upon the paper, edited by James Forrest. 28 pp. pl. 8vo. *London, 1887*
Line between Bessbrook and Newry and its equipment.
4317. **Lockwood, Thomas D.** On the siphon recorder and cable telephony. (Trans. Amer. Instit. Electr. Engin., Vol. 5, pp. 21-25; Discussion, pp. 25-34.) 8vo. *New York, 1887*
—See also 2285.
4318. **Preece, (Sir) (William) H(enry).** Jubilee of the telegraph. (Blackfriars Mag., 1887, pp. 1-6+65-71+113-123+162-169.) 8vo. *London, 1887*
Brief historical sketch with statistics.
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4319. **Tobler, A(dolf).** Ueber aeltere und neuere Methoden zur Pruefung von Unterseekabeln waehrend der Legung. (Electro-techn. Zeitschr., Year 8, pp. 437-442+539-546.) ill. 4to. *Berlin, 1887*
Testing submarine cables. (Autograph copy dedicated to Latimer Clark.)
4320. **(Cartoon commemorative of the jubilee year (1887) of the electric telegraph in England, with figures of Faraday, Cooke and Wheatstone.)** 1 p. Folio. *London, 1887*

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4321. **The Phonopore**, (Langdon-Davies). (*The Times*, Febr. 26, 1887.) 1 p. Folio. *London, 1887*
4322. **Ayrton**, W(illiam) E(dward) & **John Perry**. The efficiency of incandescent lamps with direct and alternating currents. (*Philos. Mag.*, Ser. V, Vol. 25, pp. 476-482.) 8vo. *London, 1888*
It is shown that the efficiency of an incandescent lamp is the same for both direct and alternating currents.
- 4323.—The magnetic circuit of dynamo-machines. (*Philos. Mag.*, Ser. V, Vol. 25, pp. 496-510.) 1 plate. 8vo. *London, 1888*
The characteristic curve of a dynamo discussed.
—See also 3791, 3858.
4324. **Gore**, G(eorge). Effect of chlorine on the electro-motive force of a voltaic couple. (*Proc. Roy. Soc.*, Vol. 44, pp. 151-152.) 8vo. *London, 1888*
The *e. m. f.* is found to increase within a certain limit by the addition of chlorine.
- 4325.—A method of detecting dissolved chemical compounds and their combining proportion. (Abstract.) (*Proc. Roy. Soc.*, Vol. 45, pp. 265-267.) 8vo. *London, 1888*
The paper in the Proceedings of which this is merely an abstract contains diagram of the author's "voltaic balance."
- 4326.—Relative amounts of voltaic energy of electrolytes. (Abstract). (*Proc. Roy. Soc.*, Vol. 45, p. 268.) 8vo. *London, 1888*
Upwards of 1,000 aqueous solutions were examined.
—See also 3022.
4327. **Grubb**, (Sir) Howard. New arrangement of electrical control for driving clocks of equatorials. (*Monthly Notices Roy. Astronom. Soc.*, Vol. 48, pp. 352-356.) 1 plate. 8vo. *London, 1888*
Drawings and details of construction given.
—See also 4083.
4328. **Macalay**, James. James Clerk Maxwell. (New Biographic Series, Series No. 14.) 16 pp. 8vo. *London, (1888?)*
Clerk Maxwell, from the religious view-point.
4329. **Nipher**, Francis E(ugene). The Volt, the Ohm and the Ampère. (*Journ. Ass. Engin. Soc.*, Vol. 7, pp. 83-89.) ill. 8vo. *New York, 1888*
Discussion of the practical electrical units.
—See also 3834.
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Function of the Davy lamp popularly explained.
—See also 3556.
4331. **Thompson**, Silvanus P(hillips). On the price of the factor of safety in the materials for lightning-rods. (*Philos. Mag.*, Ser. V, Vol. 25, pp. 170-171.) 8vo. *London, 1888*
The argument is in favor of iron for lightning rods.

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- 4332.—On the formulae of Bernoulli and of Haecker for the lifting of magnets. (*Philos. Mag., Ser. V, Vol. 26, pp. 70-73.*) 8vo.
London, 1888
It is shown that the lifting-power of magnets is proportional to the polar surface.
- 4333.—Note on continuous current transformers. (*Philos. Mag., Ser. V, Vol. 26, pp. 157-162.*) 8vo.
London, 1888
Certain effects common to continuous current and alternate-current transformers.
- 4334.—Note on the conditions of self-excitation in a dynamo machine. (*Philos. Mag., Ser. V, Vol. 26, pp. 469-475.*) 8vo.
London, 1888
The fundamental equation is established and various dynamo phenomena discussed.
—See also 3847.
4335. Tomlinson, Herbert. The temperature at which nickel begins to lose suddenly its magnetic properties. (*Philos. Mag., Ser. V, Vol. 25, pp. 372-379.*) 8vo.
London, 1888
The author finds that the temperature at which the permeability of nickel vanishes depends on the magnetizing.
4336. A talk on telegraphic topics. (*Telegraphic statistics.*) 52 pp. 8vo.
New York, (1888?)
4337. Rawson, Frederic Lawrence. Memoir. (Manufacturer and Inventor, May 15, 1888.) 1 p. portr. Folio.
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4338. (Sketch of life and work of Sir Charles Tilston Bright.) (Excerpt, *Minutes Proc. Instit. Civil. Engin., Vol. 93.*) 9 pp. 8vo.
London, 1888
4339. Detail of establishing and working a standardizing laboratory. 6 pp. L. folio.
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4340. Ayrton, W(illiam) E(dward) & John Perry. Testing the power and efficiency of transformers. (*Journ. Soc. Electr. Engin., Vol. 17, pp. 157-176; Additional note added April, 1888.*) ill. 8vo.
London, 1889
Calorimetric method of testing transformers.
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4341. Clark, (Josiah) Latimer.—Letter from Sir Michael Foster, Secretary of the Royal Society, informing Mr. Clark of his election as Fellow, June, 1889.
1889
4342. Forbes, George. Formulae for converters. (*Journ. Soc. Electr. Engin., Vol. 17, pp. 153-156.*) 8vo.
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4343. Gore, G(eorge). Relative amounts of voltaic energy of dissolved chemical compounds. (Abstract.) (*Proc. Roy. Soc., Vol. 45, p. 442.*) 8vo.
London, 1889
Upwards of 250 aqueous solutions of dissolved chemical compounds examined.

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- 4344.—On the rate of decomposition of chlorine-water by light.
(Abstract.) (Proc. Roy. Soc., Vol. 46, pp. 362-363.) 8vo.
London, 1889
Diffused daylight and direct sunlight used.
—See also 3022.
4345. Kapp, Gisbert. On alternate-current transformers with special reference to the best proportion between iron and copper.
(Journ. Soc. Electr. Engin., Vol. 17, pp. 96-119; Discussion, pp. 156-238.) ill. 8vo.
London, 1889
—See also 4299.
4346. Mackenzie, J. Kenneth D. The distribution of electricity by means of secondary generators or transformers. (Journ. Soc. Electr. Engin., Vol. 17, pp. 120-153; Discussion, pp. 156-238.) ill. 8vo.
London, 1889
(Autograph copy.)
4347. Mond, Ludwig & Carl Langer. A new form of gas battery.
(Proc. Roy. Soc., Vol. 46, pp. 296-304.) ill. 8vo. *London, 1889*
4348. Perry, John. On mechanical engineering in electrical industries. 24 pp. 2 plates. 8vo.
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4349. Thompson, Silvanus P(hillips). Optical torque. (Extract, Proc. Roy. Instit., 1889.) 24 pp. ill. 8vo. *London, 1889*
The polarization of light with description of some polarizing apparatus.
- 4350.—The deduction of the elementary theory of lenses and mirrors from wave principles. (Philos. Mag., Ser. V, Vol. 28, pp. 232-248.) 8vo. *London, 1889*
The author shows how the elementary theory of lenses and mirrors can be deduced from the wave theory.
—See also 3847.
4351. City and guilds of London Institute for the advancement of technical education. City technical science classes. Philip Magnus, Director. 3 pp. 4to. *London, (188-)*
4352. Bramwell, (Sir) Frederick (Joseph). (1818-1903.) The application of electricity to welding, stamping and other cognate purposes. (Excerpt, Minutes Proc. Instit., Civil Engin., Vol. 202.) 39 pp. 8vo. *London, 1890*
At the date of the paper (1890) the application of electricity to welding was comparatively new.
—See also 4216.
4353. Chrystal, George. Letter addressed to Prof. Fitzgerald. (Electrician, Vol. 25, p. 309.) ill. 8vo. *London, 1890*
Note on Ohm's law and the bridge method of determining the resistance-function E/C .
—See also 2187.

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4354. Fawcus, William Paul James & Edward Woodrowe Cowan. The Keswick water-power electric light station. With an abstract of the discussion upon the paper, edited by James Forrest. (Excerpt, Minutes Proc. Instit. Civil Engin.) 13 pp. 1 plate. 8vo. *London, 1890*
This was the first attempt in England to utilize water-power for the public supply of electric light.
4355. Gore, G(eorge). Examples of "Solution-compounds." (Proc. Birmingham Philos. Soc., Vol. 7, pp. 33-42.) 8vo. *Birmingham, 1890*
The term "solution-compound" is applied to denote substances which exist only while dissolved in water.
- 4356.—On a new method and department of chemical research. (Philos. Mag., Ser. V, Vol. 29, pp. 401-427.) 8vo. *London, 1890*
Method for determining the variation of electromotive forces with variation of concentration of the solution in primary cells.
—See also 3022.
4357. Lodge, (Sir) Oliver (Joseph). The Leeds meeting of the British Association from the point of view of section A. (Electrician, Vol. 25, pp. 573-577.) 8vo. *London, 1890*
Remarks on the B. A. unit of resistance, and on Ewing's "induction of magnetism."
—See also 3827.
4358. Preece, (Sir) W(illiam) H(enry). On the character of steel used for permanent magnets. (Electrical Rev., Vol. 27, pp. 305-307.) ill. Folio. *London, 1890*
The magnetometer method of testing was used; results of the tests are given.
- 4359.—On the form of submarine cables for long distance telephony. (Electrical Rev., Vol. 27, pp. 309-311.) ill. Folio. *London, 1890*
The telephone cable referred to is the one between Dover and Calais. The principal articles of the specification are given.
- 4360.—The sanitary aspects of electric lighting. (Extract, Trans. Sanitary Instit., Vol. 11.) 14 pp. 8vo. *London, 1890*
—See also 3556.
4361. United States, Naval Observatory. Report of the superintendent for 1890. (Report, Secr. Navy, 1890, pp. 92-103.) 8vo. *Washington, 1890*
Brief report on the magnetic work of the year.
4362. Backhouse, T(homas) W(illiam). The structure of the sidereal universe. 21 pp. 3 maps. 4to. *Sunderland, 1891*
4363. Ellis, William. On the diurnal variations of magnetic elements, as depending on the method of tabulation. (Philos. Mag., Ser. V, Vol. 31, pp. 36-41.) ill. 8vo. *London, 1891*
The comparison includes the declination, the horizontal force, and the vertical force.
—See also 3344.

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4364. **Varley, S(amuel) Alfred.** Is science disciplined knowledge, or is it something else? (Electrical Rev., Vol. 28, pp. 4-6+44-48+96.) 8vo. *London, 1891*
The author is disposed to think "that the student would find the writings of Lodge and Thomson a mental exercise and very little more, whereas they could not possibly read the writer's contributions without obtaining some knowledge of the laws that govern physical phenomena," p. 12.
—See also 3109.
4365. **Smithsonian Institution.** Smithsonian meteorological tables. (Smithsonian Misc. Coll., No. 844.) 59 pp. tab. 8vo. *Washington, 1893*
Thermometric, barometric, hygrometric and geodetic tables.
4366. **Greenwich, Royal Observatory.** Reduction of Greenwich meteorological observations. Part III. Temperature of the air as determined from the observations and records of the fifty years 1841-1890 made at the Royal Observatory, Greenwich, now collected under the direction of W. H. M. Christie. xiv+119 pp. pl. 4to. *London, 1895*
The discussion as well as the preparation of the tables was carried out under the superintendence of William Ellis, F. R. S.
—See also 2893.
4367. **Hipkins, W. E.** Wire rope and its applications. v. pp. ill. pl. 4to. *Birmingham, 1896*
Colored illustrations showing application to aerial cableways, wire-rope driving, underground haulage, suspension bridges, preceded by historical sketch.
- DATE OF PUBLICATION UNKNOWN.
4368. **Bravais, A(uguste) (1811-1863) & C. B. Lilliehook.** (1809-1890.) Variations de la déclinaison magnétique, observées avec le magnétomètre. 33 pp. 1 plate. 8vo.
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—See also 2513.
- 4380. Electric Telegraph Company.** General Code book. 12 l. 8vo.
(London, 1850?)
- 4381.—**Rules and regulations to be observed by inspectors and line-men, in the service of the Electric Telegraph Company. 20 pp. 12mo.
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- 4384. Electric Telegraph Company.** General orders, rules, and regulations. 58 pp. 16mo.
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4391. **London and North Western Railway.** General instructions for electro-telegraphic train signals. 14 pp. 16mo. *London, 1855*
—See also 4413, 4455, 4536, 4541, 4684, 4829.
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4393. **Field, Cyrus W(est).** (1819-1892.) The Atlantic telegraph. 20 pp. 8vo. *London, 1856*
—See also 3021.
4394. **Electric and International Telegraph Company.** Rules and regulations and catalogue of the traveling library. 22 pp. 8vo. *London, 1857*
—See also 4383.
4395. **South Eastern Railway.** Rules and regulations for the conduct of the traffic and guidance of the officers and men in the service of the South Eastern Railway Company. Telegraph Department. 110 pp. 16mo. *London, 1857*
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4396. **Indo-European Telegraph.** Tariff. 1 p. Folio. *1858*
4397. **Lee, (Robert Bristow) & Nightingale.** Telegraph code. 20 pp. 8vo. *Liverpool, 1858*
—See also 3726.
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—See also 4386.
4400. **Thomson, (Sir) William (Lord Kelvin) (1824-1907) & Edward Orange Wildman Whitehouse.** Atlantic telegraph. Rules to be followed in the electrical department from the sailing of

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the ships (Niagara and Agamemnon) to lay the cable, till the end of the operation. 1 p. Folio. *London, 1858*

—See also 2946, 3709.

4401. **Adley, Charles C(oles).** Manual of instructions. Part II: Construction of lines. (East Indian Railway Electric Telegraph Department.) 21 pp. 13 plates. 8vo. *Calcutta, 1859*

—See also 3162.

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SECTION VII

Patent Specifications—Litigation

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Patent Specifications—Litigation

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The electric dial telegraph.
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5002. **Mapple, Henry.** Specifications of patents for improvements in apparatus for transmitting electricity between distant places,

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Conductors, insulated and enclosed in leader tube.

—See also 5003, 5012.

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A form of the double-needle telegraph.

—See also 5012.

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—See also 3062, 3666.

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5154. **The Magnetic Telegraph Company and the Parish of St. Luke Middlessex.** Report of an appeal against rating on telegraph property. 9 pp. 12mo. *Westminster, 1856*
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5155. **Liverpool.—Board of Trade Report.** First and Second report of the Liverpool Compass Committee to the Board of Trade, 1855 and 1856; with letters from the Astronomer Royal thereupon. 74 pp. incl. appendices. 20 plates. Folio. *London, 1857*
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Letters from Maury, Morse and others.
5157. **Bombay Government.**—Selections from the records of the Bombay Government, Edited by R. Hughes Thomas. New Series, No. 43. 500 pp. L.8vo. *Bombay, 1856-1857*
Miscellaneous information connected with the Persian Gulf.
5158. **Great Britain—Admiralty Office.** Deep sea soundings in the North Atlantic Ocean between Ireland and Newfoundland, made in H. M. S. *Cyclops*, Lieut.-Commander Joseph Dayman, in June and July, 1857. 73 pp. 1 map. 4 plates. 8vo. *London, 1858*
Tables of magnetic declination taken on the voyage.
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- 5161.—Extracts of any correspondence between the Secretary of State and the Government of Newfoundland and the other North American Colonies, with respect to any acts passed for giving an exclusive right to the establishment of telegraphic communication between this country and the North American to one company. 36 pp. Folio. *London, 1858*
- 5162.—Return of telegraph companies to which concessions or guarantees of aid from the treasury have been granted or promised, between January 1st, 1854, and March 1st, 1858. 1 p. Folio. *London, 1858*
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- 5169.—Papers explanatory of the intended transfer of the Falmouth and Gibraltar Electric Telegraph Cable, to a line from Rangoon to Singapore. 11 pp. Folio. *London, 1860*
- 5170.—Returns of names of all companies incorporated either by Act of Parliament or Royal Charter, or otherwise, with power to establish and manage lines of Electric Telegraph, with the dates of the Acts of Charters; distinguishing whether they are in operation or in abeyance; and of all criminal prosecutions against persons in the employment of electric telegraph companies for improperly divulging the purport of any message, etc. 21 pp. Folio. *London, 1860*
- 5171.—Third report from the select committee on packet and telegraphic contracts; together with the proceedings of the committee minutes of evidence and appendix. xii+113 pp. 2 maps. Folio. *London, 1860*
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5173. **Glass vs. Boswall.** Affidavits and arguments thereon for a new trial. 204 pp. 8vo. *London, 1861*
- 5173a.—Transcript of Messrs. Cock's shorthand notes of summing up. 19 pp. 8vo. *London, 1861*
The plaintiff complained of injury of property by driving a nail into Messrs. Glass and Elliot's electric cable.

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5175. **Great Britain Parliamentary and State Papers.—Telegraphs.** Report of the joint committee to inquire into the construction of submarine telegraph cables; together with the minutes of evidence and appendix. xlv+519 pp. pl. diagram and charts. Folio. *London, 1861*
Among those who gave evidence are: Sir William Thomson (Lord Kelvin), Latimer Clark, W. H. Preece, Prof. Hughes, Fleeming Jenkin, Sir. C. W. Siemens.
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For shortening route of steamers to India.

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- 5205a.—Abstract from report to the Government on five lengths of submarine telegraph cables by different manufacturers. 1 l. 4to. *Bombay, 1865*
The cables were sent by Government for submergence in or near the Persian Gulf for the purpose of testing practically their relative merits.

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Twenty-five cases are stated.
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Evidence given by Latimer Clark, Edward Bright, Stanley Jevons, Culley, Scudamore and others.
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Lieut-Colonel Stewart was director-general of the Indo-European telegraphs.
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—See also 3519.
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Given proposal to incorporate the United States Postal Telegraph Company.
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The committee of the Board of Directors regarded the scheme as one to enrich its promoters at the expense of the private interests which it sought to supplant.
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Mr. Richard Herring invented in 1870 a method of printing telegraphic messages.

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—See also 3940.
5275. **Midland Railway Company** and H. M. Postmaster-General. Proceedings in arbitration. 50+83+74+7+5+42+592 pp.+Appendix, 152 pp. Folio. *London, 1874*
The proceedings were occasioned by the acquisition of telegraphs by the government.
—See also 5320.
5276. **Parliamentary Paper.** Post Office telegraphs. Account showing the gross amount received during 1872. 1 p. Folio. *London, 1874*
- 5277.—Account showing the gross amount received during 1873. 1 p. Folio. *London, 1874*
- 5278.—Account of receipts and payments by the Postmaster-General in respect of telegraph undertakings, extensions, etc., from 1868 to 1873. 37 pp. Folio. *London, 1874*
- 5279.—Return of the number of telegraph messages accepted by offices of the Telegraph Department, during 1872 and 1873, for transmission to Malta, Egypt, India, China and Australia. 1 p. Folio. *London, 1874*
5280. **Lancashire and Yorkshire Railway Company** and H. M. Postmaster-General. Proceedings and arbitration. v pp. Folio. *London, 1875*
Testimony given by Latimer Clark, C. F. Varley, R. S. Culley and W. H. Preece.
—See also 5320.
5281. **The Panama and South Pacific Telegraph Company** and the India Rubber, Gutta-Percha and Telegraph Works Company. Judgment. 8 pp. Folio. *London, 1875*
- 5281a.—Judgment given by Vice Chancellor V. C. Malins. 35 pp. Folio. *London, 1875*
—See also 4432, 4764.
5282. **Parliamentary Paper.** An account or estimate of sums expended on account of the Post-Office telegraph service by other departments in 1870-1873. 3 pp. Folio. *London, 1875*
- 5283.—Post-Office telegraphs. An account of receipts and payments by the Postmaster-General in respect of telegraph undertakings, extensions, etc., for March 31st, 1873-March 31st, 1874. 23 pp. Folio. *London, 1875*
- 5284.—Post-Office telegraphs. An account showing the gross amount received during 1874. 1 p. Folio. *London, 1875*

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- 5285.—Correspondence respecting a reserved bill of the Canadian Parliament entitled "An act to regulate the construction and maintenance of marine electric telegraphs." 9 pp. Folio.
London, 1875
- 5286.—Report of a committee appointed by the Treasury to investigate the causes of the increased cost of the telegraph service under the acquisition of the telegraphs by the state. 13 pp. Folio.
London, 1875
5287. **North Eastern Railway Company** and Her Majesty's Postmaster-General. Arbitration; first day proceedings. 17 pp. 4to.
London, 1876
—See also 5320.
5288. **Parliamentary Paper.** Accession of Great Britain to the International Telegraphic Convention, signed at St. Petersburg, July 10, 1875. 10 pp. Folio.
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- 5289.—Post-Office telegraphs. Account of receipts and payments by the Postmaster-General in respect of telegraph undertakings, extensions, etc., for the year ended 31st March, 1875. 22 pp. Folio.
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- 5291.—Letter from the Postmaster-General to the Treasury containing observations on the reports of the committee appointed to investigate the causes of the increased cost of the telegraph service. 15 pp. Folio.
London, 1876
- 5292.—Report from the select committee on Post-Office (Telegraph Department), together with the proceedings of the committee of evidence, and appendix incl. general-index. xxxvi+331 pp. Folio.
London, 1876
5293. **Herring, Richard.** Lecture on personal experiences of English Department Government. 29 pp. 8vo.
London, 1877
Complaint of neglect by the Government of the author's telegraph instrument.
—See also 3940.
5294. **Great Britain—Board of Trade.** Eleventh annual report of the Warden of the standards on the proceedings and business of the standard weights and measures department for 1876-1877. 12 pp. 8vo.
London, 1877
Operations in aid of scientific research.
- 5294a.—Twelfth report for 1877-1878. 12 pp. 8vo.
London, 1878
—See also 5220.
5295. **Parliamentary Paper.** Accounts of the Post-Office telegraph service during the year ended March 31st, 1876. 3 pp. Folio.
London, 1877

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- 5296.—Post-Office telegraphs. Account of receipts and payments by the Postmaster-General in respect of telegraph undertakings, extensions, etc., for the year ended March 31st, 1876. 12 pp. Folio. *London, 1877*
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Views of Sir William Snow Harris on lightning conductors approved.
5302. **Herring, Richard.** The two petitions of Richard Herring to Her Majesty the Queen. 9 pp. Folio. *London, 1878*
Petitions referring to the author's telegraph inventions.
—See also 3940.
5303. **Loeffler, Johann Carl Ludwig vs. Direct United States Cable Company.** Proceedings in arbitration. 3rd-22nd day. (Institution of Surveyor's Papers, pp. 71-917+30 pp.) Folio. *London, 1878-1879*
Proceedings in the liquidation of the Direct United States Cable Company.
—See also 4517.
5304. **Great Britain—Board of Trade.** Weights and measures act, 1878. 10 pp. Folio. *London, 1878*
—See also 5220.
5305. **Parliamentary Paper.** Account of receipts and payments by the Postmaster-General in respect of telegraph undertakings, extensions, etc., during 1876-1877. 9 pp. Folio. *London, 1878*
- 5306.—Account of the Post-Office telegraphs for the year ended the 31st day of May, 1877. 3 pp. Folio. *London, 1878*

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- 5307.—Account showing the gross amount received and expended in respect of the telegraph service from the date of the transfer of the telegraphs to the state to the 31st March, 1877. 3 pp. Folio. *London, 1878*
- 5308.—Account showing the gross amount received and expended on account of the telegraph service during 1876-1877. 3 pp. Folio. *London, 1878*
5309. Abstract of cases relating to the measure of damages in telegraph cases. 24 pp. L.8vo. *(1878?)*
5310. Great Britain—House of Commons. Report from the select committee on lighting by electricity; with the proceedings of the committee. xi+249 pp. pl. Folio. *(London,) 1879*
Testimony of Kelvin, Tyndall, Siemens, Preece, Conrad W. Cooke and others.
5311. Parliamentary Paper. Account of receipts and payments by the Postmaster-General in respect of telegraph undertakings, extensions, etc., for the year ended March 31st, 1878. 5 pp. Folio. *London, 1879*
- 5312.—Accounts of the Post-Office telegraphs for the year ended 31st of March, 1878. 3 pp. Folio. *London, 1879*
- 5313.—Account showing the gross amount received and expended in respect of telegraph service during 1870-1878. 3 pp. Folio. *London, 1879*
- 5314.—Account showing the gross amount received and expended on account of the telegraph service during the year ended 21st of March, 1878. 3 pp. Folio. *London, 1879*
- 5315.—Agreement dated May 9th, 1879, entered into by the Lords Commissioner of Her Majesty's Treasury with the Telegraph Construction and Maintenance and Eastern Telegraph Companies for establishing telegraphic communication with the South African colonies. 7 pp. Folio. *London, 1879*
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- 5317.—Report of the Treasury officers of accounts on the subject of certain representations made to the Treasury respecting the purchase by the Post-Office of the undertaking of the United Kingdom Electric Telegraph Company under the provisions of the telegraph act, 1868. 2 pp. Folio. *London, 1879*
5318. Thompson, John L. The inviolability of telegraphic dispatches; argument before the committee on privileges and

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elections of the United States Senate for the Western Union Telegraph Company. 18 pp. 8vo. *Washington, 1879*
 It is held that telegraph companies may not produce in courts of law the original copy of a dispatch.

5319. **Great Britain—Post Office Department.** Petition of Postmaster-General (John Manners against Liverpool lighting.) 3 pp. Folio. *London, 1879*
 —See also 4458.
5320. **Great Britain—Postmaster General.** Report (26th) on the post-office. 60 pp. 8vo. *London, 1880*
 Short report on the telegraph service.
 —See also 5244, 5273, 5275, 5280, 5287.
5321. **Postal telegrams.**—Deputation to the Postmaster-General. (Journal Society of Arts, Vol. 28, pp. 735-739.) 4to. *London, 1880*
 Reduction of the price of the inland telegram.
5322. **Gisborne, Frederick N(ewton).** (1821-1892.) Report on telegraph and signal service. With maps of each system 1881-1882, Ottawa, Canada. 20 pp. 8vo. *Ottawa, 1881*
 —See also 3578.
5323. **Great Britain—Board of Trade.** Proceedings and business under the weights and measures act, 1878. 21 pp. 4to. *London, 1881*
 Withworth gauges; the metric system.
 —See also 5220.
5324. **Varley, C(romwell) F(leetwood)** (1828-1883) & **W(illiam) E(dward) Ayrton.** Joint report of Stearns vs. Submarine Telegraph Company between Great Britain and the Continent of Europe. 24 pp. 8vo. *London, 1881*
 —See also 3372, 3858.
5325. **Bower, George Spencer & Walter Webb.** Law relating to electric lighting, being the electric lighting act, 1882, with commentary, also, a general introduction explaining its scope and probable working and an appendix consisting of the rules of the Board of Trade issued under the powers thereby granted. xx+259 pp. 8vo. *London, 1882*
- 5325a.—Second edition. xxiv+389 pp. 8vo. *London, 1889*
5326. **Fitzgerald, J. V. Vesey.** Electric lighting act, 1882, and the rules issued under the act, with short explanatory notes and cases and the several acts incorporating therewith. xxv+123 +viii pp. 8vo. *London, 1882*
 Useful to consumers as well as suppliers of electricity.
5327. **Great Britain—Board of Trade.** Bill for the lighting of the Borough of Liverpool. (42 & 43 Vict.—Sess. 1878-1879.) 19 pp. Folio. *Liverpool, 1882*

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- 5328.—Electric lighting act, 1882. (45 & 46 Vict. Ch. 56.) ii+21 pp. Folio. *London, 1882*
- 5328a.—Electric lighting act, 1882. Rules made by the Board of Trade with respect to applications for licenses and provisional orders, etc. 4 pp. Folio. *London, 1882*
- 5328b.—Digest of the law on electric lighting. Vestry of Paddington. With appendix containing list of offences and penalties, a copy of the electric lighting acts, 1882 and 1888, and rules made by the Board of Trade. 71 pp. 8vo. *London, 1888*
 Note on Lord Thurlow's amendment to the electric lighting act, 1882.
- 5328c.—Electric lighting act, 1882. Committee formed on the suggestion of President of the Board of Trade, to frame clauses in amendment of the electric lighting act, 1882, and to confer with the Board of Trade as to the terms of the provisional orders and licenses. 12+1+ii+10 pp. Folio. *London, 1885*
 Text and amendments; also list of members.
- 5328d.—Electric lighting act, 1882. Report of executive committee and list of members. 12 pp. Folio. *London, 1885*
- 5328e.—Electric lighting act, 1882. Amendment. (H. L.) A bill (as amended in committee) instituted an act to amend the electric lighting act, 1882. 4 pp. Folio. *London, 1887*
- 5329.—Copy of correspondence between the Board of Trade and Telegraph Cable Companies on the subject of protecting from injury submarine cables and vessels engaged in laying and repairing submarine cables. 39 pp. Folio. *London, 1882*
 —See also 5220.
5330. **Parliamentary Paper.** Report for the select committee on electric lighting bill, together with the proceedings of the committee and minutes of evidence. xviii+310 pp. Folio. *London, 1882*
 Evidence of Sir Frederick Bramwell, Spottiswoode, Hopkinson, Siemens, Crompton and others.
5331. **Blakesley, Thomas Holmes.** Electricity at the Board of Trade. 24 pp. 8vo. *London, 1883*
 Remarks on the electric lighting bill, 1882.
 —See also 2379.
5332. **Cunynghame, Henry.** Treatise on the law of electric lighting with the acts of Parliament, and rules and orders of the Board of Trade, a model provisional order, and a set of forms; to which is added a description of the principal apparatus used in electric lighting, with illustrations. viii+295 pp. ill. L.8vo. *London, 1883*
 Besides the official acts and explanatory notes, there are chapters on dynamos, lamps, motors, conductors and storage batteries.

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5333. **Frost, A(lfred) J.** Catalogue of works on earth currents. (From Report to the Lords of the committee of Council on Education by the committee of advice, with respect to the International Congress for the determination of electrical units to be held at Paris in October, 1883.) 8 pp. 12mo. *London, 1883*
—See also 5768.
5334. **Great Britain—Board of Trade.** Bill respecting the establishment of a submarine telegraph cable between the Islands of Teneriffe and Saint Louis, Senegal. 25 pp. 8vo. *Paris, 1883*
The bill is in French and in English.
—See also 5220.
5335. **Great Britain—Post Office Department.** Copy of Treasury minutes with regard to the reduction of the minimum charge for post office telegrams. 1 p. Folio. *London, 1883*
—See also 4458.
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- 5338.—Electric lighting provisional orders (No. V) Bill (St. James and St. Martin's (London) Order.) Petition of the Telegraph Construction and Maintenance Company. Against.—By counsel. 4 pp. Folio. *London, 1883*
- 5339.—Electric lighting provisional orders (No. V) Bill (St. James and St. Martin's (London) Order. Petition of the inhabitants, etc., of the Parish of St. James, Westminster. Against.—By counsel. 8 pp. Folio. *London, 1883*
- 5340.—Report from the select committee on electric lighting, provisional order bills; together with the proceedings of the committee, minutes of evidence and appendix. 147 pp. Folio. *London, 1883*
—See also 5346.
5341. **Parliamentary Paper.** Copy of correspondence on the subjects of a proposed investigation into the respective merits of gas, oil and electricity as lighthouse illuminants, including correspondence between the Board of Trade and Professor Tyndall. 62 pp. Folio. *London, 1883*
- 5342.—Copy of further correspondence of the subject of the composition of the lighthouse illuminants committee (in continuation of Parliamentary Paper No. 168). 15 pp. Folio. *London, 1883*

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- 5343.—Draft report: committee on the electric lighting act of 1882.
7 pp. Folio. *(London, 1883)*
5344. Great Britain—Post-Office Department. Post-Office and the
Telephone companies. 48 pp. 4to. *London, 1884*
Appeal against the post-office for telephonic facilities, (1884).
—See also 4458.
5345. Haywood, William. Reports to the Streets Committee of the
Commissioners of Sewers of London as to the Commission
undertaking to supply electricity in a district of the city, and
upon various proposals by companies and others for lighting
by electricity. 24 pp. 8vo. *London, 1884*
(Autograph copy.)
—See also 4840.
5346. London—Board of Trade. (MS. minutes of a meeting of the
general committee appointed to frame amendment to the elec-
tric lighting act of 1882.) 1 p. Folio. *London, 1885*
—See also 5337.
5347. Great Britain—Board of Trade. Report of the electric lighting
committee as to the action to be taken by the Vestry in the
matter of supplying electricity for the lighting purposes in
Paddington. 47 pp. 8vo. *Paddington, 1889*
Advantages of electric incandescent lighting, p. 24.
—See also 5220.

SECTION IX

Expositions—Congresses—Societies—
Banquets, etc.

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Expositions—Congresses—Societies—Banquets, etc.

5348. **London Electrical Society.** Report of the committee appointed to test the action of an instrument invented by Lieutenant R. J. Morrison, and denominated by him a portable magnetic electrometer. 8 pp. 3 plates. 8vo. *London, 1838*
5349. **Clark, (Josiah) Latimer.** (1822-1898.) Announcement of a lecture on the electric telegraph given at Great Marlow, Jan., 1854. 1 p. 4to. *Marlow, 1854*
—See also 2897.
5350. **Der Deutsch-Oesterreichische Telegraphenverein.** (Didaskalia, August 8, 1854.) 4to. *Frankfurt, 1854*
A statistical note of the Austro-German Telegraph-Union.
5351. **Society for the Encouragement of Arts, Manufacture, and Commerce, etc.** Catalogue of the 10th exhibition of inventions, 1858. 56 pp. ill. L.8vo. *London, 1858*
5352. **Dodwell, R(ober) t.** Circular on proposed exhibition of telegraph apparatus. 1 p. 4to. *Manchester, 1861*
—See also 1514, 4467.
5353. **Varley, C(romwell) F(leetwood).** (1822-1883.) The telegraph service at the Free Trade Hall, Manchester. (Technologist, Vol. 2, pp. 81-86.) 8vo. *London, 1861*
—See also 3372.
5354. **Catalogue of apparatus etc., in telegraphic exhibition.** 8 pp. 8vo. *(London, 1861?)*
5355. **British and Irish Magnetic Telegraph Company.** Inventions exhibited at the International Exhibition, 1862. 1 p. Folio. *London, 1862*
Telegraph-instruments exhibited.
—See also 4571.
5356. **Jenkin, (Henry Charles) Fleeming.** (1833-1885.) Report on the electrical instruments at the International Exhibition, 1862. (Juror's reports of International Exhibition, Class xiii, 44-98.) 4to. *London, 1863*
—See also 3137.

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5357. **Atlantic Telegraph Company.** Report of the proceedings at the inauguration banquet given by Mr. Cyrus W(est) Field of New York on Friday the 15th of April, 1864. 32 pp. 8vo. *London, 1864*
Speeches of Messrs. Cyrus W. Field, Latimer Clark, Cromwell F. Varley, John Pender.
—See also 4543.
5358. **Field, Cyrus W(est).** (1819–1892.) Report of the proceedings at an inauguration banquet to commemorate the renewal by the Atlantic Telegraph Company of cable laying from Ireland to Newfoundland. 32 pp. L.8vo. *London, 1864*
—See also 3021.
5359. **International Telegraph Convention of Paris.** (April 18th, 1865.) 23+7 pp.+Annexes, 3 pp. table+22 pp. Supplement. Folio. *Paris, 1865*
5360. **International Telegraph Convention** (June 30th, 1858). (Called the Brussels Convention.) 24 pp. Folio. *Bombay, 1865*
5361. **Institution of Civil Engineers, London.** Catalogue of the library. Second edition. viii+412 pp. 8vo. *London, 1866*
The appendix contains the catalogue of the Horological Library bequeathed to the Institution.
—See also 5469, 5499.
5362. **New York Chamber of Commerce.** Report of the proceedings at the banquet given to Cyrus W(est) Field at the Metropolitan Hotel, Nov. 15th, 1866. 94 pp. 8vo. *New York, 1866*
Brief history of the Atlantic cable: difficulties, delays, success.
5363. **Du Moncel, Th(eodore) Achille Louis.** (1821–1884.) La télégraphie à l'exposition universelle de 1867. (Etudes sur l'exposition de 1867, pp. 364–388.) ill. plate. L.8vo. *Paris, 1867*
Notice of the various telegraph systems exhibited, including that of Hughes and Abbe Caselli.
—See also 3343.
5364. **Hooper, W(illiam).** Description of Mr. Hooper's patent insulated wires and cables, exhibited in the Paris exhibition. 1 l. 4to. *London, (1867?)*
—See also 3546.
5365. **Tefft.** Remarks at the dinner given by the Americans in Paris, August the 17th, at the Trois Frères, to S. F. B. Morse, in honor of his invention of the telegraph and on the occasion of its completion under the Atlantic Ocean. 7 pp. 8vo. *Paris, (1867?)*
5366. **Hjorth, Soren.** Batterie magnéto-électrique. 28 pp. 1 plate. 4to. (Exposition Universelle, Paris, 1867.) *Paris, 1868*
Short description with diagrams of Hjorth's magneto-electric machine, exhibited at Paris, 1867.

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5367. **International Telegraph Convention of Paris, 1865**, revised at Vienna, 1868. 29 pp.+18 pp. Terminal rates+31 pp. Vienna conference. Folio. *London, 1868*
5368. **Conférence Télégraphique Internationale, Vienna, 1868**. Documents. 459 pp. Folio. *Vienna, 1868*
General statements relating to the transmission of telegrams, tariffs, etc.
5369. **Paris, Exposition Universelle, 1867**. Catalogue of the British section containing a list of the exhibition of the United Kingdom and its colonies and the objects which they exhibit with statistical introductions and an appendix. v pp. ill. 8vo. *London, 1868*
- 5370.—**British Commission. Reports. Presented by command.** Vols. I to IV. 8vo. *London, 1868*
Reports referring to telegraph apparatus, photography, mining and metallurgy.
5371. **Banquet to Cyrus W(est) Field, to be held at Willis's rooms, 1st July, 1868.** 2 l. 4to. *London, 1868*
The committee on invitation to the banquet.
- 5371a. **Proceedings at the banquet held in honour of Cyrus W(est) Field, of New York, in Willis's rooms, London, on Wednesday, July 1st, 1868.** 80 pp. 12mo. *London, 1868*
Speeches delivered and cablegrams sent during the banquet.
5372. **Paris, Exposition Universelle, 1867.** La télégraphie à l'Exposition Universelle de 1867. 268 pp. ill. L.8vo. *Paris, 1869*
Apparatus of Hughes, Caselli, Bonelli; the Atlantic cable; pneumatic transmission.
5373. **Landing of the French Atlantic cable at Duxbury, Mass., July, 1869.** 57 pp. 6 plates. 8vo. *Boston, 1869*
Cerémonies on the occasion with photographs of the beach.
5374. **Society of Telegraph Engineers, London.** Rules and regulations. 15 pp. 8vo. *London, 1871*
- 5374a.—(The same.) vi+13 pp. 8vo. *London, 1871*
- 5374b.—List of officers and members and rules and regulations. 18 pp. 8vo. *London, 1872*
- 5374c.—Rules and regulations. 15 pp. 8vo. *Westminster, 1874*
- 5374d.—List of members and rules and regulations. 28 pp. 8vo. *Westminster, 1874*
—See also 4909.
5375. **Horsford, E(ben) N(orton).** (1818–1893.) Address at the Morse memorial meeting in Faneuil Hall, April 16th, 1872. 95 pp. 8vo. *Boston, 1872*
Succinct account of telegraphic discovery and invention.
5376. **International Telegraph Convention, revised at Rome, 1872.** Translated by Alfred Brasher. 27+29 pp. Special rates, 36 pp. Rome Conference. Folio. *Rome, 1872*

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- 5377.—Documents de la Conférence Télégraphique Internationale de Rome publiées par le Bureau International des Administrations Télégraphiques. 688+vi pp. 4to. *Berne, 1872*
Classification and transmission of telegrams as well as special taxes relating thereto.
- 5377a.—Memorandum on proposed alterations in the International Telegraph Convention at Rome, by Bateman-Champain. With appendix by A. Brasher, containing a plan of a fixed tariff per word for telegraphic correspondence between India and Europe and from India to America. 15 pp. Folio. *1874*
5378. Siemens, (Sir) Charles William. (1822-1883.) Inaugural address delivered to the members of the Society of Telegraph Engineers. 19 pp. 8vo. *London, 1872*
Subjects suggested for papers to be read before the Society.
—See also 3107.
5379. Society of Telegraph Engineers, London. Annual reports. 1872, 1873, 1874. 8vo. *London, 1872-1874*
List of papers read.
—See also 4909.
5380. Report of the submarine companies upon the result of their attendance at the Telegraphic Conference, Rome, Dec., 1871, and Jan., 1872. 79 pp. 8vo. *London, 1872*
Advantages of belonging to the convention.
5381. Globe Telegraph Company. Report of the proceedings at the anniversary banquet given by Cyrus W(est) Field, of New York, at Buckingham Palace Hotel, London, on Monday, the 10th of March, 1873, in commemoration of the signature of the agreement on the 10th of March, 1854, for the establishment of a telegraph across the Atlantic. 22 pp. 4to. *London, 1873*
Speeches; list of guests.
—See also 4634.
5382. Meteorological Society (of Great Britain). List of fellows. 11 pp. 8vo. *London, 1873*
5383. Ditchener, Leander. Die Telegraphen-Apparate. (Officieller Ausstellungs-Bericht herausgegeben durch die General-Direction der Weltausstellung, 1873.) 56 pp. 6 plates. 8vo. *Vienna, 1874*
Telegraph apparatus at the Vienna exposition, 1873.
5384. Neumayer, G(eorg) B(althasar). Report on weather telegraphy and storm warnings, presented to the Meteorological Congress at Vienna by a committee appointed at the Leipzig Conference. 60 pp. 8vo. *London, 1874*
The chief question discussed was: "Does the interchange of Weather Tele-

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grams appear so useful that it should receive a fuller development and firmer organization?"

—See also 3554.

- 5385. Society of Telegraph Engineers, London.** Conversazione given by Sir William Thomson at King's College, Strand, Dec. 2nd, 1874. 6 pp. 8vo. *London, 1874*

List of exhibits.

—See also 4909.

- 5386. Thomson, (Sir) William (Lord Kelvin).** (1824–1907.) Inaugural address to the Society of Telegraph Engineers, London. 24 pp. 8vo. *London, 1874*

The earth as a great magnet; atmospheric electricity.

—See also 2946.

- 5387. Brooks, David.** (1820–1891.) Report on telegraphs and apparatus. (Vienna International Exposition, 1873.) 44 pp. 8vo. *Washington, 1874*

List of historical telegraph apparatus exhibited with dates.

—See also 1821, 5098, 5647.

- 5388. Clark, (Josiah) Latimer.** (1822–1898.) Address as president of the Society of Electrical Engineers, London, on the respective merits and durability of gutta-percha and India-rubber joints. (Journ. Soc. Electr. Engin., Vol. 4, pp. 319–334.) 8vo. *London, 1875*

- 5389.—**Inaugural address as president of the Society of Telegraph Engineers, London, on the origin and development of the electric telegraph. 23 pp. 8vo. *London, 1875*

Historical and statistical; the Ronalds's library transferred in trust of the Society of Telegraph Engineers; Glanvill's disproof (1665) of telegraphic communication; C. M. (Charles Marshall) and the Scots Magazine, 1753 (see No. 378); Sir Francis Ronalds's telegraph, 1816 (see No. 729).

- 5390.—**Catalogue of exhibits at the conversazione given by Latimer Clark, President of the Society of Telegraph Engineers. 12 pp. 4to. *London, 1875*

The exhibit contained some old and very rare books on magnetism and electricity from Latimer Clark's collection, now included in the Wheeler gift.

—See also 2897.

- 5391. International Telegraph Convention.** Concluded at St. Petersburg, 1875. 7+70 pp. 1 table. Folio. *London, 1875*

- 5392.—**Convention Télégraphique Internationale conclue le (10) 22 juillet 1875 à St. Petersburg. 38 pp. Folio. *1875*

Rules regulating international telegraphic service.

- 5393.—**Documents de la Conférence Télégraphique Internationale de St. Petersburg publiés par le Bureau International des Administrations Télégraphiques. 677 pp. 4to. *Berne, 1876*

The conference treated such matters as the classification of telegrams, the use of a private code, tariff for international messages, etc.

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5394. **Society of Telegraph Engineers, London.** *Conversazione* given by (Josiah) Latimer Clark at Willis's Rooms, King St., St. James's, Dec. 21st, 1875. 12 pp. 4to. *London, 1875*
List of exhibits.
—See also 4909.
5395. **Lines, Robert B.** Report on telegraphs and on telegraphic administration. (Vienna International Exhibition, 1873.) 88 pp. ill. 8vo. *Washington, 1876*
Historical collection exhibited by the German Government.
5396. **Philadelphia, International Exhibition, 1876.** Official catalogue of the British section. Part I. ill. map. pl. 4to. *London, 1876*
Extensive account of the natural resources of Queensland.
5397. **Society of Telegraph Engineers, London.** *Conversazione* given by the president and council at Willis's Rooms on Monday, Dec. 18th, 1876. 4 l. 8vo. *London, 1876*
Catalogue of exhibits.
—See also 4909.
5398. **Thomson, (Sir) William (Lord Kelvin).** (1824-1907.) Address to the mathematical and physical section of the British Association, Glasgow, Sept. 7th, 1876. (Engineering, Vol. 22, pp. 235-236, 241-243, 256, 265.) Folio. *London, 1876*
Impressions of the Philadelphia centennial exhibition, 1876.
—See also 2946.
5399. **Ayrton, W(illiam) E(dward).** Preliminary catalogue of the apparatus in the Telegraph Museum. 20 pp. 8vo. *Tokyo, 1877*
—See also 3858.
5400. **Philosophical Society, Glasgow.** Petition to the House of Commons against a bill for consolidating with amendments the act relating to letter patent for inventions. 10 pp. 8vo. *Glasgow, 1877*
The petition bears the signature of William Thomson.
5401. **Siemens, (Sir) Charles (William).** (1822-1883.) Inaugural address delivered at annual general-meeting of Iron and Steel Institute, March, 1877. 30 pp. 8vo. *Newcastle-upon-Tyne, 1877*
"Let technical schools confine themselves to teaching those natural sciences which bear upon practice, but let practice be taught in the workshop and in metallurgical establishment," p. 4.
—See also 3107.
5402. **Society of Telegraph Engineers, London.** Circular relating to the Gauss centenary. (English and German text.) 5 pp. 4to. *London, 1877*
"Aided by his younger friend, Wilhelm Weber, he (Gauss) erected the first electric telegraph."
—See also 4909.

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5403. Thomson, (Sir) (William) (Lord Kelvin). (1824-1907.) Reports on the Philadelphia National Exhibition of 1876. Vol. I. Report on "electric and telegraphic apparatus" at the centennial exhibition. pp. 271-272. 8vo. *London, 1877*
—See also 2946.
5404. Wray, Cecil & Leonard Wray, Jr. Instruments exhibited at the soirée of the Royal Society, April 25th, 1877. 3 pp. 8vo. *London, 1877*
Circular on telephones.
5405. American Electrical Society. Constitution and by-laws and list of officers and members. 16 pp. 24mo. *Chicago, 1878*
5406. International Meteorological Congress, Vienna. Reports to the permanent committee of the first international meteorological congress at Vienna on atmospheric electricity, maritime meteorology, weather telegraphy. 97 pp. 1 plate, ill. 8vo. *London, 1878*
The report on atmospheric electricity is by Prof. J. D. Everett.
5407. Clark, (Josiah) Latimer. (1822-1898.) Letter to the President and Council of the Society of Telegraph Engineers. 2 pp. 4to. *London, 1879*
Need of forming a society of electricians.
—See also 2897.
5408. Field, Cyrus W(est). (1819-1892.) Invitation to Latimer Clark. *New York, 1879*
This card is interesting artistically and telegraphically.
—See also 3021.
5409. International Telegraph Convention, 1879. Signatures of delegates. 6 pp. Folio. *London, 1879*
- 5410.—International Telegraph Convention with London revision of service regulations and tariffs, 1879. Translated by Alfred Brasher. 95 pp. Folio. *London, 1879*
Official report.
- 5410a.—Weekly diary. June 5th-July 12th, 1879. 5 printed cards. *London, 1879*
- 5410b.—Documents de la Conférence Télégraphique Internationale de Londres publiés par le Bureau International des Administrations Télégraphiques. vii+667 pp. 4to. *Berne, 1880*
Regulations referring to international telegram-tariff.
5411. Society of Telegraph Engineers, London.—Report of the committee on the Birmingham Wire Gauge; together with papers on the unit of the Birmingham wire gauge, by C(harles) V(incent) Walker; and on the Birmingham wire gauge, by (Josiah) Latimer Clark. 31+39 pp. 8vo. *London, 1879*
Among the members of the committee were: Prof. Abel, Latimer Clark, W. H. Preece, C. W. Siemens, Willoughby Smith and C. V. Walker.

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- 5412.—*Conversazione* upon the occasion of the presence in London of the delegates to the International Telegraph Conference. 11 pp. 4to. *London, 1879*
List of exhibits with names of exhibitors.
—See also 4909.
5413. *Ocean telegraphy.* 64 pp. 8vo. *New York, 1879*
Memorial of the 25th anniversary of the organization of the first company formed to lay an Ocean cable, with addresses delivered on the occasion.
5414. *Varley Electric and Scientific Works.* Exhibits at the Royal Aquarium. (Varley Patent Flexible Candle.—Patent Accumulator.—Varley-Shearer Patent Electric Meter.) 1 p. Folio. *London, (187—)*
5415. *Preliminary* report of the committee W. E. Ayrton, O. J. Lodge, J. E. H. Gordon and J. Perry, appointed for the purpose of accurately measuring the specific inductive capacity of a good Sprengel Vacuum, and the specific resistance of gases at different pressures. (British Association for Adv. of Sc., 1800, pp. 197–201.) 8vo. *London, 1880*
Specific inductive capacity of several gases.
5416. *Clark, (Josiah) Latimer.* (1822–1898). Letter to Mr. Edward Graves on the proposal to change the name of the Society of Telegraph Engineers. 14 pp. Folio. (Dated London, Febr. 20, 1880.) *London, 1880*
—See also 2897.
5417. *Preece, (Sir) W(illiam) Henry.* Inaugural address. 25 pp. 8vo. *London, 1880*
The author discusses the question "Is electricity a form of matter, or is it a form of force?"
—See also 3556.
5418. *Society of Telegraph Engineers, London.* Circular upon altering the name of the Society. 1 p. 8vo. *London, 1880*
It was recommended that the Society be called "The Society of Telegraph Engineers and Electricians."
- 5419.—Draft charter to the Society of Telegraph Engineers and Electricians. 4 pp. Folio. *London, 1880*
The names of Graves, Siemens and Latimer Clark appear in the text of the charter.
- 5420.—List of rare and curious books relating to electricity, magnetism, navigation, etc., exhibited upon the occasion of the opening of the Ronald's Library. 4 pp. 4to. *London, 1880*
Some of the rarer books in both collections (Ronald's and Latimer Clark's.)
—See also 4909.
5421. *British Association for the Advancement of Science.* Resolutions appointing a committee to determine the gauge for the manufacture of small screws. 1 p. 4to. *London, 1881*

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5422. **Chambre Syndicale de l'Electricité.** Reunion internationale des électriciens. 3 pp. 4to. *Paris, 1881*
Letter of convocation to electrical congress (1881) signed by H. Fontaine.
5423. **Collin.** Notes sur l'unification de l'heure dans Paris et dans toute la France.—Nomenclature et description des appareils exposés. (Exposition Internationale d'Electricité.) 39 pp. 8vo. *Paris, 1881*
System for the electric transmission of time.
- 5423bis. **Delaurier.**—Notice analytique des inventions de M. Delaurier à l'Exposition Internationale d'Electricité. 20+7 pp. 8vo. *Paris, 1881*
Short notice of electric inventions; note on the author's battery.
- 5424.—**Gerard, Antoine, J.** Note sur les objets exposés. (Exposition Internationale d'Electricité, Paris, 1881.) 28 pp. 3 plates. L.8vo. *Paris, 1881*
Electric lighting apparatus exhibited by the inventor at the Paris Exposition, 1881.
—See also 1643.
5425. **Hazen, W(illiam) B(abcock).** (1830–1887.) History of the signal service army of the United States and special catalogue of the United States Signal Service Exhibit at the International Exhibition of Electricity. 43 pp. 8vo. *Paris, 1881*
The modes of signaling most frequently employed are by flags, torches, heliostats, telegraphs and telephones.
5426. **International Electrical Congress, Paris, 1881.** Réunion Internationale des Électriciens. 3 pp. 4to. *Paris, 1881*
Order of meetings, subjects, etc.
- 5427.—Various papers.—Décret, programme, séances générales, première section, deuxième section, troisième section, commission électro-physiology, commission des lignes télégraphiques, commission des unités électriques. 4to. *Paris, 1881*
Minutes of various meetings. Among American representatives were Prof. Rowland of Johns Hopkins University, and Prof. Barker of the University of Pennsylvania.
- 5429.—Décret; liste des membres du congress. 1–4-séance. Liste des adhérents. Lettres. v. pp. 4to. *Paris, 1881*
This committee discussed the question of the practical electrical units.
- 5430.—Catalogue général officiel. 227 pp. ill. pl. 8vo. *Paris, 1881*
List of exhibitors of electric generators with notes on some of the more important collections.
- 5431.—Catalogue spécial des objets exposés dans la section du service des signaux. 7 pp. 8vo. *Paris, 1881*
Registering instruments for use with barometers, anemometers, pluviometers.
- 5432.—Guide.—Plan par groupes-numéros-salles. 46 pp. 8vo. *Paris, 1881*
Classified list of electrical exhibitors.

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- 5433.—Inventaire des objets envoyés par le département impérial des télégraphes de Russie. 16 pp. L.8vo. *Paris, 1881*
List of instruments exhibited at Paris, 1881, with short description of each.
- 5434.—L'électricité et ses applications exposé sommaire et notices sur les différents classes de l'exposition. 174 pp. ill. L.8vo. *Paris, 1881*
Papers on the history of electricity and magnetism; static electricity; the electrometer; primary batteries.
- 5435.—La section Suédoise, description spéciale par C. A. Nystroem. 133 pp. 12mo. *Paris, 1881*
Account of the Swedish telegraph exhibit at the Paris exhibition, 1881.
—See also 1551.
- 5436.—Note pour MM. les members du jury. 16 pp. 4to. *Paris, 1881*
Pamphlet directing the attention of the jury to the exhibit of the Society.
- 5437.—Notices sur les objets exposés par les divers services de la ville de Paris. 65 pp. 4to. *Paris, 1881*
Notice on the construction of lightning rods; telegraph apparatus (city of Paris), at the exposition of 1881.
- 5438.—Rapport of the jury international des récompenses. Groupe IV. 4 pp. Folio. *Paris, 1881*
Remarks of the jury on the group of electrical exhibits, including a Holtz machine, certain galvanometers, and electrometers.
- 5439.—Règlement général. 3 pp. 4to. *Paris, 1881*
- 5440.—Section Belge. Catalogue officiel. 55 pp. 1 plan. 12mo. *Brussels, 1881*
Official catalogue.
- 5441.—(Two photographs of the Exposition 10x8½ cm.) *(Paris, 1881)*
- 5442.—Catalogue officiel (Section Belge). lxxv+55 pp. pl. 12mo. *Brussels, 1881*
Brief notice of the electrical industry in Belgium.
- 5443.—Society of Telegraph Engineers and of Electricians.—Guide book to the British section at the Paris electrical exhibition. 80 pp. 8vo. (Special No. of the Journal of the Society.) *London, 1881*
- 5444.—Special-Katalog fuer Deutschland. 60 pp. 12mo. *Berlin, 1881*
List of electric apparatus exhibited by Germany at the Paris Exposition, 1881.
5445. Munro, J(ohn). The jubilee of electricity. Paris, 1881. 12 pp. 12mo. *Paris, 1881*
Thoughts suggested by the Paris International Exhibition of electricity.
—See also 3696.
5446. Society of Telegraph Engineers and of Electricians. Conversazione on the occasion of Helmholtz's visit to London. 4 pp. 4to. *London, 1881*
—See also 4909.

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5447. **Zetzsche**, (Karl) Ed(uard). (1830-1894.) *Geschichtliche Telegraphenapparate in der Ausstellung fuer Electricitaet zu Paris, 1881.* (Elektrotechnische Zeitschrift, Vol. 2, pp. 354-362+492-503.) 4to. *Berlin, 1881*
Notes on the historical telegraph apparatus at the Paris exposition, 1881. (Autograph copy.)
—See also 3899.
5448. **Electrotechnical Society.** Origin and operation of the Electro-Technical Society. 30 pp. 12mo. *Berlin, 1881*
Society founded in 1879 for the promotion of the technical application of electricity.
5449. **Projet de programme pour les séances du Congrès International d'Electricité, 1 Aout, 1881.** 8 pp. 4to. *Paris, 1881*
5450. **Beetz**, W(ilhelm) von, O. von **Mueller** & E. **Pfeiffer**. Officieller Bericht ueber die im Kgl. Glaspalaste zu Muenchen, 1882, stattgehabte Internationale Elektricitäets-Ausstellung, verbunden mit elektrotechnischen Versuchen. 2 vols. 244+154 +vi pp. ill. 4to. *Munich, 1882*
Official report on the Munich Exposition of 1882.
—See also 3491.
5451. **Boulard**, J. Production et applications de l'électricité. (Revue de l'Exposition Internationale d'Electricité.) 156 pp. ill. L.8vo. *Paris, 1882*
General description of well-known dynamos together with elementary theory.
—See also 2264.
5452. **Conférence Internationale pour la Détermination des Unites Electriques.** 16 Oct.-26 Oct., 1882. Procès-verbaux. 161 pp. Folio.—Deuxième session. 117 pp. Folio. *Paris, 1882-1884*
Minutes of the various meetings. Among those who attended were Sir William Thomson, Prof. Fleeming Jenkin, Prof. D. E. Hughes.
- 5453.—(Additional matter.) 8 pp. Folio. *Paris, 1882*
Subject to be considered at meeting of International Conference on electrical units, Paris, 1882.
5454. **Congrès International des Electriciens, 1881.** Comptes rendus des travaux. 400 pp. ill. L.8vo. *Paris, 1882*
Papers by Marcel Deprez, Froelich; discussion on lighting conductors.
5455. **"Cosmopolite."**—**Electrical exhibition.** By a Cosmopolite. (Modern Thought, 1882, pp. 168-171.) L.8vo. *London, 1882*
The London Crystal Palace exhibition, 1882.
5456. **Edison Electric Light System.** Crystal Palace International Electric Exhibition. (Advertisement.) *London, 1882*
5457. **Glen**, W. Cunningham & Alexander **Glen**. Electric lighting act, 1882, and the acts therewith incorporated, also the rules of the Board of Trade, of October, 1882. xi+247 pp. 12mo. *London, 1882*
The powers and obligations of companies supplying electric energy defined.

CATALOGUE OF WHEELER GIFT

5458. International Electric and Gas Exhibition, London, 1882-1883.
General circular. 2 pp. 4to. *London, 1882*
—See also 5470.
5459. International Electric Exhibition, 1881-1882. Official catalogue, edited by W. Grist, with specially prepared plans, showing the position of each exhibitor and indicating the spaces lighted by various systems. 108 pp. pl. 8vo. *London, 1882*
- 5460.—Award of prizes. (Globe, August 2nd, 1882.) Folio.
London, 1882
Contains well-known names in the early period of electric lighting.
5461. Kareis, J(oseph). Das Schulwesen fuer Elektrotechnik auf der Elektricitätsausstellung in Paris. (Elektrotechnische Zeitschrift, Vol. 3, pp. 21-25+108-113.) 9 pp. L.8vo. *Berlin, 1882*
Electrical instruction in technical schools.
5462. Lightning Rod Conference, 1882. Report of the delegates from the Meteorological Society, Royal Institute of British Architects, Society of Telegraph Engineers and of Electricians and the Physical Society; with a code of rules for the erection of lightning conductors and various appendices. Edited by G. J. Symons. x+19+261 pp. 8vo. *London, 1882*
Numerous appendices contain collected information on lightning, lightning accidents, works on lightning conductors and kindred subjects.
5463. Réunion Internationale des Electriciens. 334 pp. ill. 8vo. *Paris, 1882*
Discussions on electricity and work; electric transmission and distribution of energy, electro-metallurgy; construction of cables, etc.
5464. Preece, (Sir) W(illiam) H(enry). Electrical exhibitions. (Journ. Soc. Arts, Vol. 31, pp. 80-81.) L.8vo. *London, 1882*
Peculiar features of exhibitions.
—See also 3556.
5465. Society of Telegraph Engineers and of Electricians. The President's reception at Chatham, July 11th, 1882. 1 p. 4to. *Chatham, 1882*
—See also 4909.
5466. Webb, F(rederick) C(harles). (1828-1899.) A submarine telegraphic entertainment. 4 pp. 8vo. *London, 1882*
- 5466a.—Explanation concerning "The submarine telegraphic entertainment." 2 pp. 4to. *London, 1882*
A humorous production.
—See also 3111.
5467. Allard, E. and others. Experiences faites à l'exposition d'électricité. 152 pp. 8vo. *Paris, 1883*
Remarks on the electrical measurements made on dynamos and arc lamps at the Paris Exposition of 1881 by Joubert, Potier, Tresca and others.
—See also 2220.
5468. Eastern and Eastern Extension Telegraph Companies. Invitation to meet D. Norvin Green. August 3, 1883. 1 card. *London, 1883*

CATALOGUE OF WHEELER GIFT

5469. Institution of Civil Engineers, London. List of lectures. 1 p. 4to.
—See also 5361. *Westminster, 1883*
5470. International Electric and Gas Exhibition, 1882-1883. Official catalogue and handbook, edited by W. Grist. 163 pp. 2 plans. 8vo.
Historical sketch of the gas industry; also electricity, its appliances and applications. *(London, 1883)*
- 5471.—Special report on electric lighting. pp. 181-241. 1 plan and table. 8vo.
Different systems of arc and incandescent lighting with tabulated results. *London, 1883*
—See also 5458.
5472. International Electrical Congress, Paris, 1881. Administration; jury rapports. 2 vols. 8vo. *Paris, 1883*
General information on electric generators, lamps, etc., Pacinotti, p. 80. Reports by Violle, Potier and Blavier.
5473. International Fisheries Exhibition. Illustrated description of the electric light machinery in the exhibition, with elementary notes on the production of electric currents. 31 pp. ill. 8vo.
London, 1883
Steam engines with indicator diagrams, dynamos, lamps, etc.
5474. Mourlon, Charles (A. M.). L'électricité. A l'exposition internationale et coloniale d'Amsterdam de 1883. 44 pp. 8vo.
Brussels, 1883
Telephones, electric traction and electric lighting, etc., at the Amsterdam Exposition, 1883.
—See also 5493, 5771.
5475. Société Internationale des Electriciens. (Circular on the utility of forming an International Society of Electriciens.) 2 pp. 8vo. *Paris, 1883*
- 5476.—List générale des members. 24 pp. 12mo. *Paris, 1883*
5477. Society of Telegraph Engineers and of Electricians. Inaugural address by Willoughby Smith, President. 29 pp. 2 plates. 8vo.
London, 1883
Specific inductive capacity, earth currents, protection of property against lightning, glow lamps, etc.
- 5478.—Memorandum and articles of Association. 20 pp. Folio.
London, 1883
Among the signers were: Latimer Clark, W. Grylls Adams, Hughes, Preece, Willoughby Smith and Spagnoletti.
—See also 4909.
5479. Valette, H. Société des Electriciens. (Cosmos-les Mondes, Ser. III, Vol. 5, pp. 321-324.) 8vo. *Paris, 1883*
5480. United States—Office of Naval Intelligence. General Information Series: Information from abroad, No. 11. Report on the exhibits at the Crystal Palace Electrical Exhibition, 1882; by F. J. Sprague. 169 pp. ill. pl. tab. 8vo. *Washington, 1883*
The report deals chiefly with the history, construction and operation of dynamo-electric generators and incandescent lamps.

CATALOGUE OF WHEELER GIFT

5481. **United States Signal Service.**—History of the United States Signal Service; with catalogue of its exhibits at the International Fisheries Exhibition, London, 1883. 28 pp. ill. 8vo.
Washington, 1883
Organization of the International Weather Service.
5482. **Franklin Institute.**—International Electrical Exhibition, 1884. Official catalogue. 92 pp. 8vo. *Philadelphia, 1884*
- 5482a.—Regulations of the International Exhibition to be held at Philadelphia. 11 pp. 4to. *Philadelphia, 1884*
5483. **Jenkin, (Henry Charles) Fleeming.** (1833–1885.) (Circular to electric lighting exhibitors.) 1 p. 4to. *London, 1884*
—See also 3137.
5484. **London International Health Exhibition, 1884.** Official catalogue. xcv+160 pp. 8vo. *London, 1884*
- 5485.—Special catalogue of the Education division. lx+130 pp. 7 plates. 8vo. *London, 1884*
List of exhibiting institutions with statistics of their work.
5486. **National Conference of Electricians, Philadelphia, 1884.** Proceedings. viii+300 pp. 16mo. *New York, 1884*
Full revised report of the conference; addresses by Kelvin, Newcomb, Rowland, Preece and others.
5487. **Rayleigh, (John William Strutt).** Address to the President of the British Association for the Advancement of Science. 21 pp. 8vo. *London, 1884*
Survey of recent progress in general physics.
—See also 3793.
5488. **Royal Society, London.** Exhibits at conversazione, June 11, 1884. 4 pp. 8vo. *London, 1884*
5489. **Society of Telegraph Engineers and Electricians.** Conversation in the Libraries, Museum of Physical Apparatus, Physical Laboratory, and Art Galleries of King's College, London. 8 pp. 4to. *London, 1884*
List of exhibits.
—See also 4909.
5490. **Report, Second, of the committee appointed for the purpose of determining a gauge for the manufacture of the various small screws used in telegraphic and electrical apparatus, in clock-work, and for other analogous purposes.** (Report of British Ass. Adv. Sc., 1884.) 7 pp. 8vo. *London, 1884*
Committee: Joseph Whitworth, W. Thomson, F. J. Bramwell, A. Stroh, Beck, W. H. Preece, E. Crompton, E. Rigg, A. Le Neve Foster, Latimer Clark, H. Trueman Wood and F. Buckney.
5491. **International Inventions Exhibitions, London, 1885.** Division I.—Inventions. Division II.—Music. 20 pp. Folio. *London, 1885*

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5492. **International Telegraph Convention, 1885.** International Telegraph Convention with Berlin, revision of service regulations and tariffs, 1885, translated by Alfred Brasher. 111 pp. Folio. *Berlin, (1885)*
International rules regulating the sending of telegrams.
5493. **Mourlon, Charles (A. M.).** L'électricité à l'exposition universelle d'Anvers. Part II. pp. 73-102. ill. 8vo. *Brussels, 1885*
General remarks on dynamos, transformers, thermopiles exhibited at Antwerp.
—See also 5475.
5494. **Society of Telegraph Engineers and of Electricians.** Committee on electrical nomenclature and notation. 1 p. 4to. *London, 1885*
Among the Committee were: Ayrton, Adams, Fleming, Forbes, Hughes, Preece, S. P. Thompson.
—See also 4909.
5495. **Mr. Cyrus W(est) Field's banquet to the Hon. Edward J. Phelps, the American Minister at the Buckingham Palace Hotel, on July 4th, 1885.** 36 pp. 12mo. *London, 1885*
5496. **American Institute of Electrical Engineers.** Prospectus and report of the committee on permanent quarters. 5 pp. 4to. *New York, 1887*
5497. **Jubilee of the electric telegraph dinner at the Holborn restaurant, on Wednesday, July 27th, 1887.** 11 pp. 8vo. *London, 1887*
Toast list and musical program.
5498. **Banquet to Sir John Pender.** Hotel Metropole, April 23d, 1888. (Program.) 4 pp. 8vo. *London, 1888*
List of guests.
5499. **Institution of Civil Engineers.** Dinner to American Engineering Societies in the Guild Hall. Plan of tables. 1 p. Sq. folio. *London, 1889*
Sir John Goode presided.
—See also 5361.
5500. **Institution of Electrical Engineers, London.** First annual dinner at the Criterion. 1 p. Sq. folio. *London, 1889*
Sir William Thomson (Lord Kelvin) presided.
5501. **Langdon-Davies, (Charles).** Le Phonopore. Diagramme explicatif. (Exposition Universelle, Paris, 1889.) 1 plate and 1 p. text (French and English). 8vo. *London, 1889*
—See also 2443.
5502. **Electrical Association.** Rules. 8 pp. 8vo. (First proof uncorrected.) *London, 1890*
- 5502a.—(The same.) (Fifth proof.) 8 pp. 8vo. *London, 1890*

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5503. **London Chamber of Commerce.** Electrical and allied trades section. List of the committee and members. 4 pp. Folio.
London, 1890
5504. **Chicago, Exhibition, 1893.**—British commission. Official catalogue of the British section, xlii+544 pp. pl. 12mo.
London, 1893
Electricity and electrical appliances by Prof. Ayrton; instruments of precision other than electrical and magnetic by Prof. S. P. Thompson.

WITHOUT DATE.

5505. **Clark, (Josiah) Latimer.** (1822–1898.) Letter referring to the transfer of the Ronald's Library to the Society of Telegraph Engineers. (See No. 2207.)
- 5506.—Program of lecture on electricity as applied to telegraphy.
—See also 2897.
5507. **Catalogue of Persian Telegraph Library.** 26 pp. 12mo.
List of 890 books in the library.

SECTION X

Trade Catalogues, Circulars and
Price Lists

SECTION X

Trade Catalogues, Circulars and Price Lists

5508. **Pilbrow, James.** Atmospheric railway and canal propulsion and pneumatic telegraphs. Second edition. 42 pp. 3 plates. 8vo. *London, 1844*
5509. **Wall, A.** On Wall's improvements in the manufacture of iron, copper, steel, and other metals by the application of voltaic electricity. ii+46 pp. 8vo. *London, 1846*
In the author's process the impure iron as it flows from the blast furnace is subjected to a strong electrical current. The paper contains a note on the electrical origin of meteoric bodies.
—See also 2854.
5510. **Davis, Daniel.** Catalogue of apparatus, to illustrate magnetism, galvanism, electro-dynamics manufactured and sold by Daniel Davis. 46 pp. ill. 12mo. *Boston, 1848*
—See also 1012.
5511. **Fuller's patent mercury-bichromate battery.** Folio. *1849*
5512. **Société Carpentier et Cie.** Rapports scientifiques et industriels et autres documents authentiques sur la galvanism du fer, procédé Sorel. 94 pp. 8vo. *Paris, 1849*
The Sorel process for galvanizing iron.
5513. **Electric Telegraph Company.** Handbook to the electric telegraph, being a popular explanatory treatise on the construction, nature and powers of this wonder-working instrument, with a full account of its origin and progress; also a drawing and explanation of the electric clock. Third edition. 30 pp. ill. pl. 12mo. *London, (1850?)*
Scale of charges; the electric clock.
—See also 2933.
5514. **Gutta-Percha Company.** Patent gutta-percha tubing. (Circular.) 2 l. 4to. *London, (1850)*
—See also 5540, 5546.

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5515. Sax, Julius. Illustrated description of new series of telegraph instruments. 34 pp. 8vo. *London, (1850?)*
5516. Dempster, Henry. New equilateral triangular telegraph; especially adapted for yachters, coasters, fishermen, etc. Second edition. 64 pp. ill. Sm. 4to. *Edinburgh, 1851*
—See also 2800.
5517. Shephard, Charles (Upham). On the application of electro-magnetism as a motor for clocks. 24 pp. ill. 8vo. *London, 1851*
5518. Warson, Joseph J. W. A few remarks on the present state and prospects of electrical illumination; with a description of the author's patented inventions in galvanic batteries and electric lamps. 31 pp. 8vo. *London, 1853*
The author's "*Chronomatic battery*," which is the cast-iron battery of Callan modified; notes on electric illumination.
5519. Railway Electric Signals Company. (Description of the system.) 13 pp. 2 plates. 12mo. *London, (1855?)*
Railway signals designed and patented by Tyer.
- 5519a. — (Another edition.) 2 pp. Folio. *London, (1855?)*
5520. Siebe, Gorman and Company. Description of diving apparatus and instructions for submarine operations. iv+67 pp. ill. pl. 4to. *London, (1855?)*
Description of electric fuses, torpedoes, igniting apparatus.
—See also 4474.
5521. Bonelli, G. Du télégraphe des locomotives de G. Bonelli, système destiné à prévenir les collisions sur les chemins de fer. 16 pp. ill. 8vo. *Paris, 1856*
The author's system of railway signaling.
—See also 4691.
5522. Elliott Brothers. Descriptive catalogue of voltaic and thermoelectric instruments and apparatus manufactured by Elliott Brothers. 14 pp. ill. 8vo. *London, (1856?)*
—See also 5589, 5831.
5523. Godefroy, P. A. Godefroy's improved gutta-percha. 8 pp. 8vo. *London, 1856-1858*
Prepared cocoa-nut shell added to gutta-percha.
5524. Hamilton, John. Improved insulators with metallic arm. 2 pp. 8vo. (Circular.) *Liverpool, 1856*
The invention of Edwin Clark.
5525. — Iron telegraph standards. 2 l. Folio. *Liverpool, (1856?)*
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- 5667b.—**Rules of the library.** 1 p. 4to. *London, 1881*
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5672. **Barraclough, Thomas & Co.** Price list of electric wire, strand and cable machinery. 8 pp. 4to. *Manchester, 1881*
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General outline of the author's proposed electric railway.

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5676. Clerc, L. & A. Bureau. Eclairage électrique par la lampe Soleil. 4 pp. 8vo. *Paris, 1881*
Note on the lampe-Soleil (an arc lamp).
5677. Crompton, R. E. & Co. Crompton's system of electric lighting. (From Engineering.) 38 pp. ill. 4to. *London, 1881*
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5678. Deschiens, D. E. Télégraphie et horlogerie électrique. (Système Liais.) 4 pp. 4to. *Paris, 1881*
Note on electric registering apparatus for astronomical observations.
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Faure's storage battery.
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Catalogue notes on the generation, distribution and transformation of electric currents.
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Dynamo of Charles E. Ball, of Philadelphia.
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The author's battery.
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- 5708bis. a.—Description of C. Vernon Boys' engine power meters, with practical directions for its use. 16 pp. 2 plates. 4to. *London, (?)*

The meter is designed for the direct measurement of the work done by steam, gas, water and hot-air engines.
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Brief description of the author's battery with commercial application.
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(London,) 1889
5804. House-to-House Electric Light Supply Company. The advantages of the electric light in residences, clubs, etc. 64 pp. 16mo.
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—See also 5522.
5835. Elliott, William & Sons. List of mathematical, optical, and philosophical instruments manufactured by William Elliott and Sons. 4 pp. 12mo. *London*
5836. Engert, A. C. Patent inventions for the improvement of sound by the aid of tuned steel wires and plates. 4 pp. 8vo. *(London)*
5837. George, E. Nouvel appareil télégraphique, système E. George. 4 pp. ill. 8vo. *Paris*
Improved form of telegraph.
5838. Home, Thomas. (Handbill advertising the galvanic and electro-magnetic telegraphs on the Gt. Western railway.) 1 l. 8vo. *London*
5839. Irish, W. E. Irish's alphabetical type printing and letter indicating telegraph instrument. 1 p. 8vo. *London*
5840. Lee, (Robert Bristow), & Rogers. Specification-drawings of Riband post. 1 plate. Folio. *Manchester*
—See also 3726.
5841. Negretti, (Henry), and the Zambra's patent hourly recording thermometrical apparatus. (Circular.) 4 pp. ill. 8vo.
5842. Russell, F. & Co. Electric repeater or distant signal indicator. (For railways.) (Circular.) 1 l. 4to. *London*
—See also 5584.
5843. Siemens Brothers' alphabetical telegraphs. 4 pp. pl. 4to. *London*
—See also 4445.
5844. Siemens and Halske. Telegraphen- Signal- und Sicherungseinrichtungen fuer Eisenbahnen. 34 pp. 6 plates. ill. L.8vo. *Berlin*
Apparatus for electric signaling on railways with numerous illustrations.
- 5845.—Price list and drawings, labeled Telegraphische Zeichnungen, E. Roschenbusch. 45 plates. 4to.
—See also 4527.
5846. Waelput, O. Construction et placement de paratonnerres perfectionnés, brevetés. 11 pp. 8vo. *Gand*
The author's system of lightning conductors.

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5847. Wells and Hall. Price list of India-rubber insulation and of wire. 16 pp. 8vo. London
—See also 3185.
5848. Western Electric Manufacturing Company. Electro-medical and surgical apparatus. 32 pp. ill. 8vo. Chicago and New York
—See also 5608.
5849. Whitehouse, (Edward William Orange) & (Latimer Josiah) Clark. (Circular relating to electrical recorder.)
—See also 2897, 3709.
5850. Windsor Foundry and Iron Works. Iron telegraph standards; Hamilton's patent. 2 pp. ill. Folio. Liverpool
5851. Zanni.—Description of Zanni's magneto-electric bell-pull. 1 p. 4to. London
—See also 5618.
5852. Zenger, Ch(arles) von. Symmetrische Blitzableiter. 2 pp. 4to. Prague
Note on the author's system of protecting buildings from lightning.
—See also 3272.

SECTION XI

Periodicals

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Periodicals

- 5853. Albany Institute, Transactions.** 8vo. *Albany, 1830-1893*
 Vol. 1, Vol. 2, No. 1. 1830-1833.
 The *Transactions* complete comprise 12 volumes, covering the years 1830-1892. Vol. 1, pp. 22-24, contains the first paper written by Joseph Henry, entitled "On Some Modifications of the Electro-magnetic Apparatus," in which he proposes the use of a plurality of turns of wire to intensify the effect of a magnet, instead, as proposed by Sturgeon (*Annals of Philosophy*, Vol. 12, p. 357), of using a single turn and large current for the same purpose. The paper was read before the Institute, Oct. 10, 1827. Vol. 1 also contains a paper by Gen. Schuyler, presented April 27, 1825, entitled "Table of Variations of the Magnetic Needle," giving the results of observations at Boston, Falmouth and Penobscot, which indicated a sudden change in the rate of variation of magnetic declination.
 The Albany Institute was formed in 1824 by the union of the Society for the Promotion of Useful Arts (founded 1791 and incorporated 1793) and the Albany Lyceum of Natural History (founded 1823). The Institute was incorporated in 1829. In 1900 it united with the Albany Historical and Art Society to form the Albany Institute and Historical and Art Society.
- 5854. American Electrical Society, Journal.** Including original and selected papers on telegraphy and electrical science. Published irregularly. 8vo. *Chicago, 1875-1880*
 Vols. 1-3. Complete.
 Vol. 1 was published during the years 1875-1877; Vol. 2, 1878-1879; Vol. 3, 1880. Vol. 3 consists of one number only. The *Journal* was published by a Committee consisting of Messrs. Wm. H. Smith, F. W. Jones, and E. Barton.
- 5855.† American Electrician.** A journal of practical electrical and steam engineering. Sm. folio. *New York, 1896-1905*
 Vols. 8-17. Complete.
AMERICAN ELECTRICIAN. With which is incorporated *Electrical Industries*. An illustrated journal devoted to practical electricity. Vols. 8, 9, May, 1896-Dec., 1897. Continuation of *Electrical Industries* (No. 5882). In 1897, absorbed *Electrical Doings* (monthly, April, 1896-Feb., 1897).—An illustrated monthly journal of practical electrical engineering. Vol. 10, Jan.-Dec., 1898.—A journal of practical electrical and mechanical engineering. Vols. 11, 12, Jan., 1899-Dec., 1900.—A journal of practical electrical and steam engineering. Vols. 13-17, Jan., 1901-Dec., 1905.
 Editors: May, 1896-March, 1899, W. D. Weaver (July-October, 1898, Geo. T. Hanchett); April, 1899-July, 1900, J. E. Woodbridge; August, 1900-Dec., 1905, Cecil P. Poole.
 In January, 1906, the journal was absorbed by the *Electrical World and Engineer*, with change of title to *Electrical World* (No. 5887). A monthly edition of the consolidated periodical, issued from Jan., 1906, continues the volume numbering of the former monthly.

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5856. *The American Journal of Science.* *New Haven, 1818—date*

Series I, Vols. 29 to 38, 1826–1840. Now complete through gift of Dr. Cary T. Hutchinson, and additions from Library file.

THE AMERICAN JOURNAL OF SCIENCE. More especially of mineralogy, geology, and other branches of natural history; including also agriculture and ornamental as well as useful arts. Conducted by Benjamin Silliman. Series I, Vol. 1. Quarterly, consisting of four numbers. New York and New Haven, 1818. (Library volume is second edition, 1819.) The journal appeared first in July, 1818.

THE AMERICAN JOURNAL OF SCIENCE AND ARTS. Conducted by Benjamin Silliman. Vols. 2 and 3. Half-yearly. New Haven, 1820, 1821. The first number of Vol. 2 was not published until April, 1820. Vols. 4 to 49 (1822–1845). Quarterly. Vol. 50 is the general index to the entire first series.—From Vol. 34, July, 1838, conducted by Benjamin Silliman, aided by Benjamin Silliman, Jr.—Vols. 40 to 43 (1841–1842), bear on the title page the note: To be continued quarterly.—Vols. 1 to 12 were published as follows: Vol. 1, 1818 (second edition, 1819); 2, 1820; 3, 1821; 4 and 5, 1822; 6, 1823; 7 and 8, 1824; 9, 1825; 10 and 11, 1826; 12, 1827; from Vol. 13 to 49 two vols. per year were regularly published.

SERIES II. Conducted by Benjamin Silliman, Benjamin Silliman, Jr., and James Dana. Vols. 1 to 50, 1846–1870. Bi-monthly. Index for each ten vols.—From Vol. 39 on, conducted by Benjamin Silliman and J. Dana.—Vol. 40 reads also, whole number 90, and Vols. 41 to 50, whole number 91 to 100, or Nos. 121 to 150.

SERIES III. Vols. 1 to 18, 1871–1879. Monthly, with index to Vols. 1 to 10.—Vols. 1 to 10 read also, whole number 101 to 110, or No. 1 to 60. Edited by J. Dana and B. Silliman.—Vols. 11 and 12, 1876, read also, whole number 111 and 112. Vols. 13 to 18, read also, whole number 113 to 118, or No. 73 to 108.—From Vol. 16, 1878, edited by J. D. and E. S. Dana and B. Silliman.

THE AMERICAN JOURNAL OF SCIENCE. Series III, Vols. 19 to 50; also, whole number 119 to 150 or, No. 109 to 300, 1880–1895. Index for each ten vols.—Vols. 41 to 44 bear on title page: Established by Benjamin Silliman in 1818.—From Vol. 41, 1895 on, edited by E. D. Dana.

SERIES IV. Vols. 1 to date; also, whole number 151 to date, 1896 to date. Vols. 1 to 3, read also, whole number 151 to 154, or No. 1 to 18, 1896–1897.

The American Journal of Science and Arts.

See *The American Journal of Science.* (No. 5856.)

5857. *American Telegraph Magazine.* Monthly. 8vo.

New York, 1852–1853

Vol. I, No. 6, July 1, 1853.

Only six numbers published. The first is dated Oct., 1852, and edited by Donald Mann. No. 1 contains an appendix of 16 pages entitled, "A Memorial from Henry O'Reilly, and accompanying documents, proposing a system of intercourse across the American continent by mail and telegraph, etc." No. 6 deals with a controversy between O'Reilly and the Associated Press. This number announces the merging of the journal with *Shaffner's Telegraph Companion* (No. 5954).

5858. *Annales de l'Électricité.* Recueil périodique parraissant le 15 et le 30 de chaque mois. 8vo. *Brussels, 1882–1884* Vols. 1–3. Complete.

The first issue is dated Jan. 1, 1882, and the final issue, September 15, 1884.

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- 5859. Annales Télégraphiques.** Mémoires et documents relatifs à la télégraphie et à l'électricité. 8vo. *Paris, 1855-date*
 Series I, Vols. 1 and 2, 1855-1856.—Series II, Vols. 1-8, 1858-1865.—Series III. Vols. 1-21, Vol. 22, Sept. and Oct., 1874-95.—Table générale, 1855-1890.
ANNALES TÉLÉGRAPHIQUES. Publiées sous la patronage du directeur général des lignes télégraphiques. Sous les auspices de l'administration des lignes télégraphiques. Vol. 1, July-Dec., 1855; Vol. 2, Jan.-Feb., 1856.—Publication was suspended from March, 1856-July, 1858.
ANNALES TÉLÉGRAPHIQUES. Publiées par un comité composé de fonctionnaires de l'administration des lignes télégraphiques. Series II, Vols. 1-8. Bi-monthly. July, 1858-Dec., 1865.—Publication was suspended from 1866-1874.
ANNALES TÉLÉGRAPHIQUES. Series III, vols. 1-date. Bi-monthly. 1874-date.
 Table générale, 1855-1890. *Paris, 1891.* 8vo.
- 5860. Annals of Electricity, Magnetism, and Chemistry; and guardian of experimental science.** Conducted by William Sturgeon, assisted by gentlemen eminent in the departments of philosophy. 8vo. *London, 1837-1843*
 Vols. 1-10, Oct. 1836-June, 1843.
 Published irregularly from 1836-July 1840, and monthly from August 1840-June 1843. The set is complete in 10 volumes and five additional numbers.
- 5861. Annals of Philosophy.** Monthly. 8vo. *London, 1813-1826*
 Vols. 1-16, and New Series, Vols. 1-12. Complete.
ANNALS OF PHILOSOPHY, or magazine of chemistry, mineralogy, mechanics, natural history, agriculture, and the arts. By Th. Thomson, Arthur Aiken, and John Bostoch. Vols. 1-16. *London, 1813-1820.* 8vo.—Vols. 11 and 12 were edited jointly by Thomson, Aiken and Bostoch, the other volumes being edited by Thomson alone.
ANNALS OF PHILOSOPHY. Edited by R. Phillips, E. W. Brayley. Vols. 17-28, or New series, Vols. 1-12. *London, 1821-1826.*—United in 1827 with the *Philosophical Magazine and Journal* (No. 5916).
- 5862. Annals of Philosophy, Natural History, Chemistry, Literature, Agriculture, and the Mechanical and Fine Arts.** By T. Garnett and other gentlemen. 8vo. *London, 1801-1804*
 Vols. 1-3. Complete.
 The work has three subdivisions: Science, Arts and Literature. Vol. 1, 1801, edited by Dr. Garnett; Vol. 2, 1802, by C. and A. Aiken (Dr. Garnett, deceased); Vol. 3, 1804, editor not given.
- 5863. L'Année Scientifique et Industrielle, ou Exposé annuel des travaux scientifiques, des inventions et des principales applications de la science à l'industrie et aux arts qui ont attiré l'attention publique en France et à l'étranger.** Par Louis Figuier. 12mo. *Paris, 1857-date*
 Vol. 1. 1857; 19, 1876.
 There is a general index of Vols. 1-10, and also of Vols. 1-20 (1857-1877).
- 5864. Annual of Scientific Discovery: or year-book of facts in science and arts, for [1850]-1871,** exhibiting the most important discoveries and improvements in mechanics, useful arts, natural phi-

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losophy, chemistry, astronomy, geology, biology, botany, mineralogy, meteorology, geography, antiquities, etc., together with notes on the progress of science; a list of recent scientific publications; obituaries of eminent scientific men, etc. 8vo.

Boston, 1850-1871

Year 1867.

Published yearly and complete in 21 vols. Edited, 1850-1865, by D. A. Wells, assisted from 1850-1851 by George Bliss, Jr.; 1866-1869, Samuel Kneeland; 1870-1871, John Trowbridge, assisted, 1870, by Samuel Kneeland and W. R. Nichols, and in 1871, by W. R. Nichols and C. R. Cross.

Continued as *Annual Record of Science and Industry*. Edited by S. F. Baird, assisted by eminent men of science. Annually. 1872-1879. 7 vols. New York, 1871-1878.

5865. **Arcana of Science and Art:** or annual register of useful inventions and improvements, discoveries and new facts, in mechanics, chemistry, natural history, and social economy; abridged from the transactions of public societies and from other scientific journals, British and foreign. 12mo.

London, 1828-1838

Year 10, 1837.

ARCANA OF SCIENCE AND ART; or one thousand popular inventions and improvements. Abridged from the transactions of public societies and from scientific journals, British and foreign. (Year 1), 1828.

ARCANA OF SCIENCE, and annual register of the useful arts. (Year 2), 1829.

ARCANA OF SCIENCE AND ART; or an annual register of popular inventions (later "useful inventions") and improvements, etc. Years 3-11, 1830-1838.

The mention of year is omitted on the title pages for 1828-1833; from 1834 on "Year 6," etc., appear, excepting the volume for 1838. Editor, John Timbs.

Superseded by *Year-book of Facts in Science and Arts* (No. 5965).

5866. **Archives de l'Électricité**, par M. A. de la Rive. 8vo.

Paris, 1841-1845

5 Vols. Complete.

Edited by Auguste Arthur de la Rive. Supplément to *La Bibliothèque Universelle de Genève*.

Tome I includes Nos. 1-3; tome II, Nos. 4-6; tome III, Nos. 7-12; tome IV, Nos. 13-16; tome V, Nos. 17-20.

5867. **The British Almanac of the Society for the Diffusion of Useful Knowledge.** Yearly. 12mo.

London, 1828-date

Years 1843, 1848, 1853, 1858, 1867, 1883.

THE BRITISH ALMANAC. 1828. At head of title: Published under the superintendence of the Society for the Diffusion of Useful Knowledge.

THE BRITISH ALMANAC OF THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE. 1829-1886.

THE BRITISH ALMANAC. 1887-1888.

THE BRITISH ALMANAC AND FAMILY CYCLOPAEDIA. 1897-date.

The publishers were as follows: 1828, Baldwin & Cradock; 1829-1854, C. Knight; 1855-1869, Knight & Co.; 1870-1883, Company of Stationers; 1884-1896, The Stationers' Company by C. Letts & Co.

From 1828 to 1888 each volume includes the *Companion to the Almanac*; or,

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Year-book of General Information (No. 5873), with separate title-page and pagination. From 1840 on the title reads, "For the Year of Our Lord." 1844 has the note, "Being Bissextile, or Leap-year"; 1845-1847 are designated also, first, second and third year after the bissextile, the note appearing on the title-page until 1888. The year 1895 is designated 68th year, and following years are similarly numbered.

- 5868. British Annual and Epitome of the Progress of Science.** Edited by Robert D. Thomson. 12mo. *London, 1737-1739*
Vols. 1-3. Complete.

- 5869. British Association for the Advancement of Science. Reports of the Meetings.** 8vo. *London, 1833-date*
Vols. 1-8, 11-47, 1831-1838, 1841-1877. Vols. 70 and 71 have been added through gift of the New York Public Library.

Meetings: 1, York, 1831; 2, Oxford, 1832; 3, Cambridge, 1833; 4, Edinburgh, 1834; 5, Dublin, 1835; 6, Bristol, 1836; 7, Liverpool, 1837; 8, Newcastle, 1838; 9, Birmingham, 1839; 10, Glasgow, 1840; 11, Plymouth, 1841; 12, Manchester, 1842; 13, Cork, 1843; 14, York, 1844; 15, Cambridge, 1845; 16, Southampton, 1846; 17, Oxford, 1847; 18, Swansea, 1848; 19, Birmingham, 1849; 20, Edinburgh, 1850; 21, Ipswich, 1851; 22, Belfast, 1852; 23, Hull, 1853; 24, Liverpool, 1854; 25, Glasgow, 1855; 26, Cheltenham, 1856; 27, Dublin, 1857; 28, Leeds, 1858; 29, Aberdeen, 1859; 30, Oxford, 1860; 31, Manchester, 1861; 32, Cambridge, 1862; 33, Newcastle-upon-Tyne, 1863; 34, Bath, 1864; 35, Birmingham, 1865; 36, Nottingham, 1866; 37, Dundee, 1867; 38, Norwich, 1868; 39, Exeter, 1869; 40, Liverpool, 1870; 41, Edinburgh, 1871; 42, Brighton, 1872; 43, Bradford, 1873; 44, Belfast, 1874; 45, Bristol, 1875; 46, Glasgow, 1876; 47, Plymouth, 1877; 48, Dublin, 1878; 49, Sheffield, 1879; 50, Swansea, 1880; 51, York, 1881; 52, Southampton, 1882; 53, Southport, 1883; 54, Montreal, 1884; 55, Aberdeen, 1885; 56, Birmingham, 1886; 57, Manchester, 1887; 58, Bath, 1888; 59, Newcastle-upon-Tyne, 1889; 60, Leeds, 1890; 61, Cardiff, 1891; 62, Edinburgh, 1892; 63, Nottingham, 1893; 64, Oxford, 1894; 65, Ipswich, 1895; 66, Liverpool, 1896; 67, Toronto, 1897; 68, Bristol, 1898; 69, Dover, 1899; 70, Bradford, 1900; 71, Glasgow, 1901; 72, Belfast, 1902; 73, Southport, 1903; 74, Cambridge, 1904; 75, South Africa, 1905; 76, York, 1906; 77, Leicester, 1907; 78, Dublin, 1908.
General index, 1831-1860. *London, 1864.*

- 5870. British Spiritual Telegraph,** being a weekly record (monthly from Vol. 2) of spiritual phenomena. 8vo.

Keighley and London, 1857-1859

Vols. 1, 2.

The publication is complete in 3 vols., June 27, 1857-May 15, 1859, and a supplement consisting of a series of essays by J. Ashburner. Monthly from Oct., 1857-Sept., 1858. Vol. 1 published at Keighley; Vols. 2 and 3 at London.

Bulletin de la Compagnie Internationale des Téléphones.

- 5871. Bulletin International de l'Électricité.** Folio and 4to.

Paris, 1882-1895

Years 1-3, 1882-1884.

BULLETIN DE LA COMPAGNIE INTERNATIONALE DES TÉLÉPHONES. 3 years. Folio. Paris, 1882-1885. Year 1, Oct., 1882-Jan. 2, 1883; Year 2, Jan. 8, 1883-Dec. 31, 1883; Year 3, Jan. 7, 1884-Dec. 29, 1884.

BULLETIN INTERNATIONAL DES TÉLÉPHONES. 1 vol. Folio. Paris, 1886.

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BULLETIN INTERNATIONAL DE L'ELECTRICITÉ. Vols. 1-9. 4to.
Paris, 1887-1895.

5872. **Bullettino Telegrafico del Regno d'Italia.** Monthly. Sm. 4to.
Turin (later Florence and Rome), 1865-1888
Years 15, 17-21. 1879, 1881-1885.
The publication is complete in 24 vols., 1865-1888.
5873. **Companion to the Almanac; or, Year-Book of General Information.** Yearly. 12mo. *London, 1828-1888*
Years 1 to 42, 1828-1869, and Index to 1828-1843, London, 1843.
Complete in 61 years, and issued as a supplement to the *British Almanac* (No. 5868). Volume for 1849 called 19th year, and similarly up to 1888 (61st year). From 1889-1896 the *Companion* was published with the *Almanac*, with the title *British Almanac and Companion*.
5874. **Centralblatt fuer Elektrotechnik.** Erste deutsche Zeitschrift fuer angewandte Elektricitaetslehre. Herausgegeben von F. Uppenborn, Jr. Large 8vo. *Muenchen, 1880-1889*
Vols. 1-7, 1880-1885.
ZEITSCHRIFT FUER ANGEWANDTE ELEKTRICITAETSLEHRE mit besonderer Beruecksichtigung der Telegraphie, des elektrischen Beleuchtungs- wesen, der Galvanoplastik und verwandter Zweige. Vols. 1-4.—Vol. 1 complete in 12 numbers; Vol. 2 in 22 numbers; Vol. 3 in 24 numbers; Vol. 4 in 30 numbers, two being double numbers. Vols. 1 and 2 were edited by Ph. Carl; Vols. 3 and 4 by F. Uppenborn, Jr.
CENTRALBLATT FUER ELEKTROTECHNIK. Vols. 5-12, 1883-1889; Vols. 5-10 were published in 36 numbers; Vol. 11 contains 18 and Vol. 12 26 numbers.—Vols. 5-10 are also designated as Years 5-10; Vols. 11 and 12 as Year 11, Parts I and II. In 1890 the journal was incorporated with *Electrotechnische Zeitschrift* (No. 5896).
5875. **Civil Engineer and Architects' Journal.** Monthly. 4to.
Vols. 1-20, 1837-1857. *London, 1837-1868*
CIVIL ENGINEER AND ARCHITECTS' JOURNAL. Vol. 1, Oct, 1837-Dec., 1838.
CIVIL ENGINEER AND ARCHITECTS' JOURNAL, SCIENTIFIC AND RAILWAY GAZETTE. Vols. 2-13, (1839-1850).
CIVIL ENGINEER AND ARCHITECTS' JOURNAL, incorporated with the *Architect*. Vols. 14-19, 1851-1856.
CIVIL ENGINEER AND ARCHITECTS' JOURNAL. Vols. 20-31, 1857-1868.—Complete in 31 volumes.
Deutsch-Oesterreichischer Telegraphen-Verein. Zeitschrift.
See *Zeitschrift des Deutsch-Oesterreichischen Telegraphen-Vereins*. (No. 5966.)
5876. **Dublin Quarterly Journal of Science.** Containing papers, read before the Royal Dublin Society, the Royal Irish Academy, the Geological Society of Dublin and the Natural History Society of Dublin. 8vo. *Dublin and London, 1861-1866*
Vols. 1-3, 1861-1863.
Complete in 6 vols. Edited by Samuel Haughton.
5877. **Edinburgh Journal of Science.** Exhibiting a view of the progress of discovery in natural philosophy, chemistry, mineralogy, geology, practical mechanics, telegraphy, fine and useful arts. Edited by D. Brewster. 8vo. *Edinburgh, 1824-1832*

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Vols. 1-10, 1824-1829. New series, Vols. 1-6 [11-16], 1829-1832.

Title changed in new series by dropping the subtitle. Published in London, Edinburgh and Dublin.—United in 1832 with the *Philosophical Magazine* or *Annals* to form the *London and Edinburgh Philosophical Magazine* (No. 5916).

5878. **Electric Light.** Journal of electrical lighting, and record of inventions, improvements, current events in connection with this branch of scientific industry. Monthly. Folio.

London, 1882-1883

Vol. 1, May, 1882-April, 1883. Complete.

Incorporated with *The Electrical Engineer*, London, in 1883 (No. 5880).

5879. **Electric Telegraph and Railway Review.** Edited by T. E. Lundy. Weekly. 4to. London, 1870

Vols. 1, 2, Jan. 15, 1870-Nov. 19, 1870. Complete.

ELECTRIC TELEGRAPH REVIEW. Vol. 1, Nos. 1-5, Jan. 15, 1870-Feb. 12, 1870.

ELECTRIC TELEGRAPH AND RAILWAY REVIEW. Vol. 1, Nos. 6-26, Feb. 19, 1870-July 9, 1870; Vol. 2, Nos. 27-45, July 16, 1870-Nov. 19, 1870.

5880. **The Electrical Engineer.** A weekly journal of electrical engineering, with which is incorporated *Electric Light*. Folio.

London, 1882-date

Vols. 1-6 and New Series Vols. 1-14, 1882-1894. Now complete to date by additions from Library file.

ELECTRICAL ENGINEER. A journal of electrical engineering with which is incorporated *Electric Light* (No. 5878). Monthly. Vols. 2-6, May, 1883-Dec., 1887.—A weekly journal. New Series. Vols. 1-date. (From Vol. 10 on also "Old Series" 16-date).

5881. **The Electrical Engineer.** A weekly review of theoretical and applied electricity. 4to. New York, 1882-1899

Vols. 1-8, 1882-1889. Now complete by additions from Library file.

THE ELECTRICIAN. A monthly journal devoted to the advancement and diffusion of electrical science. Vols. 1, 2, Jan., 1882-Dec., 1883.

THE ELECTRICIAN AND ELECTRICAL ENGINEER. A monthly review of theoretical and applied science. Vols. 3-6, Jan., 1884-Dec., 1887. F. L. Pope, editor.

THE ELECTRICAL ENGINEER. A monthly review of theoretical and applied science. Vols. 7-9, Jan., 1888-March, 1890. F. L. Pope and G. M. Phelps, Jr., editors. — A weekly review of theoretical and applied science. Vols. 10-27, April 2, 1890-March 2, 1899. T. C. Martin and Joseph Wetzler, editors.

Incorporated with the *Electrical World*, March 11, 1899, the combined journal taking the name *Electrical World and Electrical Engineer* (No. 5887).

- 5882†. **Electrical Industries.** An illustrated monthly journal devoted to practical electricity. Monthly. Folio. Chicago, 1889-1896

Vols. 1-7. Complete.

ELECTRICAL INDUSTRIES. A monthly journal devoted to the consideration and advancement of electricity in all its applications. Vol. 1 is complete in 13 numbers, Dec., 1889-Dec., 1890. A supplement was issued in 1893, entitled *Weekly World's Fair*: Devoted to the electrical and allied

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interests of the World's Fair, its visitors and exhibitors; Vol. 1, Nos. 1-21, June 15, 1893-Nov. 2, 1893. Vol. 7 has only 4 numbers, Jan.-April, 1896. Title-pages and indexes were not issued to Vols. 1, 2 and 7. Sub-title was changed to that of main entry with No. 10, Vol. 6.

The earlier volumes contain a directory of central stations and electric railways which later was issued as a separate publication with the title *Electrical Industries Directory*, changed to *Central Station List*, and now (1908) known as *The McGraw Electrical Directory*. In 1897 the *Central Station List* absorbed *Johnston's Electrical and Street Railway Directory*, which in 1893 succeeded *Whipple's Electrical Directory*, the first issue of which appeared in 1889.

Succeeded, May, 1896, by *American Electrician* (No. 5855).

5883. **Electrical Magazine.** Conducted by Ch. V. Walker. 8vo.

London, 1843-1847

Vols. 1, 2, July, 1843-Oct., 1846. Complete.

5884. **Electrical News and Telegraphical Reporter.** Edited by Wm. Crookes. 4to. *London, 1875*

Vol. 1, July 1-Oct. 7, weekly and Oct. 14-Dec. 15, semi-monthly. 1875. Complete.

5885. **Electrical Review.** Large 8vo. and 4to. *London, 1872-date*

Vols. 1-41, 1872-1897. Now complete by additions from Library file.

TELEGRAPHIC JOURNAL AND MONTHLY ILLUSTRATED REVIEW OF ELECTRICAL SCIENCE. Vol. 1, Nos. 1, 2, Nov. 15-Dec. 15, 1872. Large 8vo.

TELEGRAPHIC JOURNAL AND ELECTRICAL REVIEW. Monthly. Vol. 1, Nos. 3-7, Jan., 1873-May, 1873. Semi-monthly. Vol. 1, Nos. 8-end and Vols. 2-9, June 1, 1873-Dec. 15, 1881. Large 8vo. Weekly. Vols. 10-29, Jan 7, 1882-Dec. 25, 1891. 4to.

ELECTRICAL REVIEW. Weekly. Vols. 30-date, Jan. 1, 1892-date. 4to. Photographs are pasted in a space reserved on the first page of a number of issues of Vols. 4-6 and 8, the subjects being Wheatstone, Latimer Clark, Sir William Thomson, Faraday, Charles W. Siemens, Werner Siemens, Prof. David E. Hughes and James Clerk Maxwell; a biographical sketch accompanies each photograph.

5886. **Electrical Review and Western Electrician.** 4to and folio.

New York, Chicago, 1882-date

Vols. 1-6, 1882-1885. Now complete by additions from Library file.

NEW YORK REVIEW OF THE TELEGRAPH AND TELEPHONE AND ELECTRICAL JOURNAL. Semi-monthly. Vol. 1, Nos. 1-8, Feb. 15, 1882-June 1, 1882. 4to.

REVIEW OF THE TELEGRAPH AND TELEPHONE. A journal of electrical, scientific and mechanical news. Semi-monthly. Vol. 1, Nos. 9-end and vol. 2, Nos. 1 and 2, June 15, 1882-March 1, 1883. Folio.

ELECTRICAL REVIEW. A weekly journal of electric light, telephone, telegraph and scientific progress. Vol. 2, Nos. 3-end and vols. 3-21, March 22, 1883-Feb. 18, 1893. Folio.

ILLUSTRATED ELECTRICAL REVIEW. A journal of scientific and electrical progress. Weekly. Vols. 22-31, Feb. 25, 1893-Dec. 29, 1897. Folio.

ELECTRICAL REVIEW. An illustrated weekly journal of scientific and electrical progress. Vols. 32-35, Jan. 5, 1898-Dec. 27, 1899. 4to.

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ELECTRICAL REVIEW. The pioneer electrical weekly of America. Vol. 36-vol. 53, No. 18, Oct. 30, 1908. 4to.

ELECTRICAL REVIEW AND WESTERN ELECTRICIAN. Chicago. 4to. Consolidation of *Electrical Review* and *Western Electrician*. Continues volume and page numbering of *Electrical Review*. First issue dated Nov. 7, 1908, Vol. 53, No. 19. The *Western Electrician*, weekly, was founded in Chicago, January, 1887. The last issue is Oct. 30, Vol. 43, No. 18.

5887. **The Electrical World.** Weekly. 4to. *New York, 1874-date*
Vols. 1, 3-15, 1883-1890. Now complete to date by gift of
Electrical World and additions from Library file.
Founded as *Operator*, 1874 (No. 5933).

THE OPERATOR AND ELECTRICAL WORLD. A journal for telegraphists, telephonists, electricians and electrical engineers. Weekly. Vol. 1, Nos. 1-16, Jan. 6, 1883-April 21, 1883.

ELECTRICAL WORLD. A weekly review of current progress in electricity and its practical applications. Vol. 1, Nos. 17-end, and Vols. 2-33, April 28, 1883-March 4, 1899. A General Index (8vo) was published in 1897, covering the years 1883-1896.

THE ELECTRICAL WORLD AND ENGINEER. A weekly review of current progress in electricity and its practical applications. Vols. 33-46, March 11, 1899-Dec. 30, 1905.—Consolidation of *Electrical World* and *Electrical Engineer*.

ELECTRICAL WORLD. A review of current progress in electricity and its practical applications. Vols. 47-date, Jan. 6, 1906-date. Consolidation of *Electrical World and Engineer* and *American Electrician*.

ELECTRICAL WORLD. Monthly edition, with separate index, Jan. 1906-date. The monthly edition and the first issue of the month of the weekly edition differ in some of the small type matter of the final reading pages and in the pagination.

5888. **The Electrician.** A weekly journal of telegraphy and general applied science. 4to. *London, 1861-1864*

Vols. 1-6, or Nos. 1-134. Complete.

THE ELECTRICIAN. A weekly journal of telegraphy, electricity and applied chemistry. Vols. 1-4, Nov. 9, 1861-Oct. 23, 1863.

THE ELECTRICIAN. A weekly journal of telegraphy and general applied science. Vols. 5 and 6. Vol. 6 consists of only 5 numbers.

Publication was resumed in 1878 with the same title.

5889. **The Electrician.** The oldest weekly illustrated journal of electrical engineering, industry, science and finance. 4to.

London, 1878-date

Vols. 1-35, 38, 39, 1878-1895, 1896-1897. Now complete by additions from Library file.

THE ELECTRICIAN. A weekly journal of theoretical and applied electricity and chemical physics. Vols. 1-19, May 25, 1878-Nov. 4, 1887 including two specimen numbers of March, 1878.—A weekly illustrated journal of electrical science, industry and engineering. Vol. 20, Nov. 11, 1887-May 4, 1888.—A weekly illustrated journal of electrical engineering, industry and science. Vols. 21-50, May 11, 1888-June 12, 1903.—The oldest weekly illustrated journal of electrical engineering, industry, science and finance. Vols. 51-date, June 19, 1903-date.

Vols. 35-40 have added to sub-title: Established 1861-1878; Vols. 41 and 42, established, first series, 1861; Vols. 43-date, second series, 1878. Established (weekly) first series, 1861; second series (weekly), 1878.

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For so-called first series of *The Electrician*, see No. 5888.

The Electrician.—*The Electrician and Electrical Engineer*.

See *The Electrical Engineer*, New York. (No. 5881.)

5890. *L'Électricien*. Revue internationale de l'électricité et de ses applications. L. 8vo. *Paris, 1881-date*
 Vols. 1-9, 1881-1885. Now complete to date, except Vols. 10-14, 1886-1890, by additions from Library file.
L'ÉLECTRICIEN. Revue générale d'électricité. Semi-monthly. Vols. 1-8, April, 1881-Dec. 15, 1884. Weekly. Vols. 9-14, Jan., 1885-Dec., 1890. L. 8vo. United in Jan., 1891, with *Revue internationale de l'électricité et de ses applications* (No. 5944).
L'ÉLECTRICIEN. Revue internationale de l'électricité et de ses applications. Second series. Weekly. Vols. 1-date, Jan., 1891-date.
5891. *L'Électricité*. Revue scientifique illustrée. Organe officiel de l'exposition internationale de l'électricité en 1877 au Palais de l'Industrie à Paris. Directeur, Armengaud jeune. 4to. *Paris, 1876-1894*
 Vols. 1-9, 1876-1885.
L'ÉLECTRICITÉ. Revue scientifique illustrée. Beaux-arts, industrie, marine, art militaire, médecine. Vol. 1. Bi-monthly, Jan. 15, 1876-Aôut, 1876. Vols. 2, 3, semi-monthly, Juillet 5, 1878-Dec. 20, 1880. Vol. 4, weekly, Jan. 8, 1881-Dec. 31, 1881.—No issues between Aôut, 1876-Juillet, 1878.
L'ÉLECTRICITÉ. Journal scientifique illustré. Vol. 5, Nos. 1-44, Jan. 7, 1882-Nov. 4, 1882.
L'ÉLECTRICITÉ. Revue scientifique illustrée. Vol. 5, No. 45-end. Vol. 6, Nov. 11 to Vol. 17, 1882-1894.
 Vols. 1-18 are also called years 1-18.
5892. *Electricity*. Journal edited by the Russian Technical Society, [in Russian language]. 4to. *St. Petersburg, 1880-1891*
 Vols. 1-3, 1880-1883.
 The publication is complete in 12 vols., 1880-1891.
5893. *Electricity and Electrical Engineering*. Weekly. 4to. *London, 1890-date*
 Vols. 1-5, 1890-1893. Now complete by additions from Library file.
 Founded in 1890 by the late Julius Maier. Acquired in 1894 by Mr. Sidney Rentell and since conducted by him.
5894. *Electro-Metallurgist and Electric Light Journal*. Edited by A. Watt. Monthly, 4to. *London, 1880- ?*
 Vol. 1, Nos. 1-6.
5895. *Der Elektrotechniker*. Aeltestes Oesterreichisch-Ungarisches Fachblatt fuer Elektrotechnik. Zeitschrift fuer angewandte Elektrizitaet mit besonderer Ruecksichtnahme auf Telegraphie, Telephonie, elektrische Beleuchtung, Kraftuebertragung und verwandte Zweige. Herausgegeben von Filipp Froehlich und Otto Froehlich. Semi-monthly. 4to. *Vienna, 1882-date*
 Vols. 1-4, 1882-1886.
DER ELECTRO-TECHNIKER. Organ fuer angewandte Electricitaet. Vols. 1, 2, 1882-1884.

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DER ELECTRO-TECHNIKER. Erstes oesterreichisch-ungarisches Fachblatt. Organ fuer angewandte Electricitaet, etc. Herausgegeben von G. Ad. Ungar-Szentmiklosy. Vols. 3-date.

Sub-title changes from Vol. 22 on to: Officelles Organ der Genossenschaft der konzessierten Elektrotechniker in Niederoesterreich.

Vols. 26-date title reads: *Elektrotechniker.* Aeltestes Oesterreichisch-ungarisches Fachblatt, etc.

5896. *Elektrotechnische Zeitschrift.* Monthly, semi-monthly and weekly. 8vo. and 4to. *Berlin, 1880-date*

Vols. 1-9, 1880-1888. Now complete by additions from Library file.

ELEKTROTECHNISCHE ZEITSCHRIFT. Monthly. Vols. 1-8, Jan., 1880-Dec., 1887. Semi-monthly, vols. 9 and 10, Jan., 1888-Dec., 1889. Large 8vo. —Centralblatt fuer Elektrotechnik. Organ des Elektrotechnischen Vereins. Redigiert von Gisbert Kapp und Jul. H. West. Weekly. Vols. 11-14, 1890-1893. Folio.—Centralblatt fuer Elektrotechnik. Organ des Elektrotechnischen Vereins und des Verbandes Deutscher Elektrotechniker. Weekly. Vols. 15-date, 1894-date. Folio.—Organ des Elektrotechnischen Vereins, 1880-June, 1894; organ des Elektrotechnischen Vereins und des Verbandes Deutscher Elektrotechniker, July, 1894-date.

Editors: 1880-1882, K. E. Zetzsche; 1883-1884, K. E. Zetzsche, A. Slaby; 1885-1886, K. E. Zetzsche, R. Ruehlmann; 1887-1888, R. Ruehlmann, G. Wabner; 1889, R. Ruehlmann, R. Petsch. 1890-Sept., 1894, F. Uppenborn; Oct., 1894-June, 1900, G. Kapp, J. H. West; July, 1900-June, 1905, G. Kapp; July, 1905-date, E. C. Zehme.

L'Elettricità.

See *La Natura.* (No. 5928.)

5897. *The Engineer.* Weekly. Folio. *London, 1856-date.*

Vols. 1-18, 23-44, 52-68, 1856-1864, 1867-1877, 1881-1889. Now complete to date, except vols. 19-22, by additions from Library file.

Separate publications: Illustrated record of British Patents; being an abstract of specifications together with notes of patent cases. The whole reprinted from "The Engineer," Jan.-June, 1881. 2 vols. London, 1881. Folio. —Portfolio of working drawings. Supplement to "The Engineer." Nos. 1-126. New Series, Nos. 1-date. London, 1868-date. Folio.—Standard locomotives. Planes. Issued as supplement to "The Engineer." London, 1888-1891. Folio.

5898. *Engineer's Journal and Railway and Public Works Chronicle of India and the Colonies.* 4to. *Calcutta, 1858-1869*

Vol. 1 (semi-monthly), 1858.

The publication is complete in 12 vols., 1858-1869.

5899. *Engineering.* An illustrated weekly journal, conducted by William H. Maw and James Dredge. Weekly. Folio.

London, 1866-date

Vols. 21-36, 1876-1883. Now complete, except Vols. 1, 2, 5, 9, 12, by additions from Library file.

Conducted by Zerah Colburn, 1866-1869; by William H. Maw and James Dredge, from 1870 to the death of the latter, August 15, 1906, who was succeeded by B. Alfred Raworth as joint editor.

A German edition was published under the title: *Engineering.* Deutsche Ausgabe der gleichnamigen technischen Wochenausgabe von W. H. Maw and J. Dredge in London, vermehrt durch deutsche original Artikel. He-

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rausgegeben von Jos. von Stummer-Traunfels. Year 1 or Vols. 1, 2, 1874.—Continued as Stummer's Ingenieur. Internationales Organ fuer das Gesamtgebiet des technischen Wissens, etc. Herausgegeben von Jos. von Stummer-Traunfels. Years 2-4 or Vols. 3-8, 1875-1877. Wien, 1874-1877. Folio. [No more published.]

5900. **The English Mechanic and World of Science.** Weekly. 4to.
London, 1865-date
Vols. 23-55, 1876-1892. Now complete, excepting a few issues, by additions from Library file.
THE ENGLISH MECHANIC. A record of mechanical invention, scientific and industrial progress, applied chemistry, arts, manufactures, engineering, building, etc. Vols. 1, 2, March 31, 1865-Sept., 1865.
THE ENGLISH MECHANIC AND MIRROR OF SCIENCE AND ART. A record of engineering, building, etc. Vols. 3-11, Sept. 29, 1865-March 18, 1870.—Consolidation of the *English Mechanic and Mirror of Science and Art*, the *Mechanic*, *Scientific Opinion* and *British and Foreign Mechanic and Scientific Instructor*.
THE ENGLISH MECHANIC AND MIRROR OF SCIENCE AND ART. With which are incorporated the *Mechanic*, *Scientific Opinion* and the *British and Foreign Mechanic*. Vols. 12-date, March 25, 1870-date.
5901. **Glasgow Mechanics' Magazine and Annals of Philosophy.** Weekly. 8vo. *Glasgow, 1824-1826*
Vols. 1-5, Jan. 3, 1824-Sept. 16, 1826. Complete.
5902. **Greenwich (England). Royal Observatory.—Results of the Magnetical and Meteorological Observations, made at the Royal Observatory at Greenwich.** Yearly. 4to.
London, 1842-date
Years 1880-1895. (1882-1897.)
5903. **India Rubber and Gutta Percha and Electrical Trades' Journal.** A monthly [later weekly] record of the Caoutchouc, Gutta Percha, Asbestos, and allied industries. 4to. *London, 1884-date*
Vol. 1, Nos. 6-12. Vol. 2, Nos. 1-8. August, 1884-March, 1886.
In 1895 an index was published to vols. 1-10, 1884-1894.
5904. **The Indian Telegraphic Journal.** Bi-monthly. L. 8vo.
London, 1875- ?
Vols. 2, Part 2, 1876.
5905. **L'Ingénieur Électricien.** Revue des progrès de l'électricité industrielle dans tous les pays du monde, journal, bi-mensuel paraissant le 5 et 20 de chaque mois. 4to.
Paris and Brussels, 1861-date
Vol. 1, semi-monthly, Aug. 5, 1886-Sept. 25, 1886. Weekly Oct. 16,—date.
First series is complete in 1 vol. No issues for 1887. From 1888 published as Deuxième Série.
5906. **L'Institut.** Journal des sciences et des sociétés savantes en France et à l'étranger. (Le propriétaire rédacteur: E. Arnould.) 4to. *Paris, 1833-1876*
Vols. 3-7, 1835-1839.
L'INSTITUT. Journal des académies et sociétés scientifiques de la France

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et de l'étranger. 1 vol. Paris, 1833.—Journal général [later universel] des sociétés et travaux scientifiques. 2 vols. [2-3] Paris, 1834-1835.—Journal général des sociétés et travaux scientifiques de la France et de l'étranger. Premier section. Sciences mathématiques, physiques et naturelles. 36 vols. [4-40] Paris, 1837-1872.—Journal des sciences et des sociétés savantes en France et à l'étranger. Premier section. 4 vols. [41-44.] Paris, 1873-1876. No more published.

- 5907. Institution of Civil Engineers, London.** Minutes of Proceedings of the Institution of Civil Engineers; with other selected and abstracted papers. 8vo. *London, 1837-date*

Vols. 9, 19-105, 1850, 1861-1894. Now complete to date, except Vols. 1-8, 10-18, by additions from Library file, together with following indexes: General Index, Vols. 1-20, 1837-1861. Name Index, Vols. 1-58, 1837-1879. Subject Index, Vols. 1-154, 4 vols., 1837-1903.

In Vols. 4-38 the sub-title reads: With abstracts of the discussions.

General index to Vols. 1-20, Sessions, 1837-1860/61. London, 1865. General index to Vols. 21-30, Sessions, 1861/62-1869/70. London, 1871. Name Index to Vols. 1-58, Sessions, 1837-1878/79. London, 1885. (This index includes index to the Transactions, Vols. 1-3.)

Subject index to vols. 1-154, 1837-1903, 4 vols. London. (Includes index to the Transactions, Vols. 1-3). Brief subject index to Vols. 59-150.

Supplement to Vol. 154: Engineering conference, 1903. Edited by J. H. T. Tudsbury. London, 1903.

Separately printed from the Minutes of Proceedings of the Institution: Abstracts of papers in foreign transactions, forming section III in each volume from 39-126, 1874/75-1895/96. Editor, James Forrest.

Separately printed from the Minutes of Proceedings: Transactions of the Institution of Civil Engineers. Vols. 1-3. London, J. Weale, 1836-1842. (Vol. 3 published by the Institution.) A list of members is in each volume. Index to Vols. 1-3 in Vol. 3. (No more published.)

Editors: 1837-1841, T. Webster and C. Manby; 1842-1858, C. Manby; 1858-1862, C. Manby and J. Forrest; 1862-1895/96, J. Forrest; 1896-date, J. H. Tudsbury.

The Institution of Civil Engineers was established in 1818, and incorporated by Royal charter in 1828.

- 5908. Institution of Electrical Engineers, Journal.** 8vo.

London, 1872-date.

Vols. 1-19, 1872-1890. Now complete by additions from Library file.

SOCIETY OF TELEGRAPH ENGINEERS' JOURNAL. Vols. 1-9. 1872-1880.

SOCIETY OF TELEGRAPH ENGINEERS AND OF ELECTRICIANS, JOURNAL. Vols. 10-17, 1881-1888.

INSTITUTION OF ELECTRICAL ENGINEERS, JOURNAL. Vols. 18-date. 1889-date.

General Index to vols. 1-10, 1872-1882; vols. 11-20, 1882-1891; vols. 21-30, 1892-1903.

Editors: Vols. 1-3, Frank Bolton and Geo. E. Preece; vol. 4, Frank Bolton and J. Sivewright; vols. 5-6, Frank Bolton and William Ed. W. Langdon; vols. 7-14, W. E. Ayrton; vols. 15-26, F. H. Webb; vols. 27-32, W. G. McMillan; vols. 33-date, G. C. Lloyd General Index to vols. 1-10 compiled by Alfred J. Frost; to vols. 11-20 by F. H. Webb, and to vols. 21-30 by W. G. McMillan.

The Institution was founded in 1871 as the Society of Telegraph Engineers;

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name changed in 1881 to Society of Telegraph Engineers and Electricians; incorporated in 1883; name changed to present form in 1889. In 1899 the Northern Society of Electrical Engineers became the Manchester local branch of the Institution.

- 5909. Internationale Elektrotechnische Zeitschrift und Bericht ueber die Elektrische Ausstellung.** Wochenschrift fuer die Gesamt-Interessen der Internationalen Elektrotechnischen Ausstellung, 1883. Redigiert von J. Kraemer und Ernst Lecher. Weekly. 4to. *Vienna, 1884*
Complete, in 24 numbers from July 15, 1883-Dec. 23, 1883.
- 5910. Italy.—Direzione Generale dei Telegrafi.—Relazione Statistica sui Telegrafi del Regno d'Italia.** Yearly. 4to.
Turin, Florence and Rome, 1865-1888
For 1872-1888. (1873-1889.)
STATISTICA DEI TELEGRAFI del regno d'Italia. 1864. Turin, 1865.
RELAZIONE STATISTICA sui telegrafi del regno d'Italia nel biennio. 1865-1870. Florence, 1866-1871.
MINISTERO DEI LAVORI PUBBLICI. Direzione statistica dei telegrafi. Relazione statistica sull' esercizio dell' anno 1871. Rome, 1872.
RELAZIONE STATISTICA sui telegrafi del regno d'Italia nel biennio 1872-1888.
The year 1873 bears as imprint, Florence and Rome; 1874-1876 Florence alone; 1877-1880 Florence and Rome; 1881-1888 Rome alone.
- 5911. Italy.—Ministero Delle Poste e dei Telegrafi.—Relazione Statistica interno ai servizi postale e telegrafico per esercizio 1889/90-1898/99.** 4to. *Rome, 1891-1901*
For 1887-89; 1892-98.
PRIMA RELAZIONE STATISTICA riguardante. I. Il servizio postale 1887-1888 e 1888-1889. II. Il servizio delle casse postale di risparmio 1888. III. Il servizio telegrafico. 1888-1889. IV. Appendix. Rome, 1890. 4to.
RELAZIONE STATISTICA intorno ai servizi postale e telegrafico per esercizio 1889/1890-1898/1899 ed al servizio delle casse postali di risparmio per l'anno 1889-1898. Con appendice. 4to. Rome, 1891-1901.
- 5912. Journal of Natural Philosophy, Chemistry and the Arts.** Illustrated with engravings. By William Nicholson. Monthly. 4to and 8vo. *London, 1797-1813*
Vols. 1, 2 and Series II, Vols. 1-36, 1797-1799; 1802-1813. Now complete by additions from Library file.
The first series comprises 5 vols. Vol. 1, 1797; 2, 1799; 3, 1800; 4, 1801; 5, 1802. Edited by W. Nicholson.—In 1803 the quarto edition was succeeded by an octavo publication with the title *Nicholson's Journal of Natural Philosophy, Chemistry and the Arts*. Illustrated with engravings. Vols. 1, 2, 1802; 3, 4, 1802; 5 and 6, 1803; 7-10, 1804; 11 and 12, 1805; 13-16, 1806; 17 and 18, 1807; 19-22, 1808; 23 and 24, 1809; 25-28, 1810; 29 and 30, 1811; 31-34, 1812; 35 and 36, 1813.
United in 1814 with the *Philosophical Magazine* (No. 5916).
Journal of Science and the Arts.
See *Royal Institution of Great Britain, Journal*. (No. 5946.)

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- 5913. Journal of the Telegraph.** 4to. *New York, 1868-date*
 Vols. 8-23, 1875-1890. Now complete to date by additions from Library file.
JOURNAL OF THE TELEGRAPH. A semi-monthly [afterward monthly] record of the progress of the telegraph and of the electrical science. Semi-monthly, Vols. 1-15, Dec. 2, 1867-March 1, 1882. Monthly, Vol. 15 from March 20-Dec. 20, 1882. The earlier numbers were of newspaper size.
JOURNAL OF THE TELEGRAPH. Monthly. Vols. 16-date. 1883-date. In 1877 absorbed *The Telegrapher* (No. 5960).
 Numbers of Vol. 1, Dec. 1867-Nov. 8, 1868 are paged separately. Vols. 1-4 published by James D. Reid; Vols. 5-date by Western Union Telegraph Company.
- 5914. Journal Télégraphique.** Publié par le Bureau International des Administrations Télégraphiques. Monthly. 4to. *Berne, 1869-date*
 Vols. 1-11, 1869-1887. Now complete to date, except Vols. 12-25, by additions from Library file.
 Published by Le Bureau International des Administrations Télégraphiques. Vol. 1 is complete in 26 Nos., Nov. 25, 1869-Dec. 25, 1871. Vols. 2-4 have 36 Nos. per year. (Vol. 2, Jan. 25, 1872-Dec. 25, 1874; Vol. 3, Jan. 25, 1875-Dec. 25, 1877; Vol. 4, Jan. 25, 1878-Dec. 25, 1880.) Vol. 5 or année 13, 1881-date, published monthly. Vol. 12, année 21, has a supplement: Nomenclature des câbles formant le réseau sous-marin du globe.
- 5915. Knowledge.** Weekly and monthly. 4to. *London, 1882-date*
 Vol. 1, 1881-1882.
KNOWLEDGE. An illustrated magazine of science, plainly worded—exactly described. Conducted by Richard A. Proctor. Vols. 1 to 8, 1881-1885. Weekly. Vol. 1, Nov., 1881-June, 1882; Vols. 2 to 7, July, 1882 to July, 1885; Vol. 8, July, 1885 to Oct., 1885.—An illustrated magazine of science, literature and art. Conducted by Richard A. Proctor. Vols. 9-11 or New Series, Vols. 1 to 3, Nov., 1885-Oct., 1888. Monthly.—An illustrated magazine of science. Simply worded—exactly described. Edited by A. Cowper Ranyard. Vols. 12 to 18. The sub-title "New Series" appears only up to Vol. 16, i.e., Vols. 4 to 8, 1888-1895. [Vol. 12, Nov., 1888-Oct., 1889. Vol. 13, Nov., 1889-Dec., 1890. Vols. 14 to 18, Jan., 1891-1895.] From Vol. 16 on the name of author is omitted from title-page.
SIMPLY WORDED—EXACTLY DESCRIBED. KNOWLEDGE. An illustrated magazine of science, literature and art. Vols. 19 to 26, 1896-1903. Vol. 27, Jan., 1904. Monthly. From Vol. 20, 1897 on the title reads "Founded by Richard A. Proctor;" also from Vol. 25, 1902, on again New Series, 17; of Vol. 27, only one number has been published.
SIMPLY WORDED—EXACTLY DESCRIBED. KNOWLEDGE AND ILLUSTRATED SCIENTIFIC NEWS. Conducted by Major B. Baden-Powell and E. S. Grew, M.A. Vols. 1 to date, Jan., 1904-date, or New Series. Vols. 1 to date. The first number of Vol. 1 was published in February; title-page reads January. Monthly.
- 5916. London, Edinburgh and Dublin Philosophical Magazine and Journal of Science.** 8vo. *London, 1798-date*
 Series I, Vols. 1-28, 43-51, 53-54, 56-60. Series II, 11 vols. (complete). Series III, vols. 1, 2, 16-18, 26-37. Series IV, Vols. 1-4, 37, 39, 43-50. Series V, Vols. 1-25, 27-35, 37, 38. 101 volumes have been added by purchase from Carnegie Fund. The collection is now complete to date by additions from

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Library file except Series I, Vol. 67 and Series V, Vols. 36 and 46.

PHILOSOPHICAL MAGAZINE. Comprehending the various branches of science, the liberal and fine arts, agriculture, manufactures and commerce. By Alexander Tilloch. 42 vols. London, 1798-1813.

United in 1814 with the *Journal of Natural Philosophy* (No. 5912).

PHILOSOPHICAL MAGAZINE AND JOURNAL. Comprehending the various branches of science, the liberal and the fine arts, geology, agriculture, manufactures and commerce. By Alexander Tilloch. From June, 1822, by Alex. Tilloch and Rich. Taylor. 26 vols. (43-68). London, 1814-1826.

United in 1827 with the *Annals of Philosophy, or Magazine of Chemistry* (No. 5861).

PHILOSOPHICAL MAGAZINE; or, annals of chemistry, mathematics, astronomy, natural history and general science. New and united series of the *Philosophical Magazine and Annals of Philosophy.* By Rich. Taylor and Rich. Phillips. 11 vols. (1-11). London, 1827-1832.

General index to Vols. 1-11. London, 1835. 8vo.

United in 1832 with the *Edinburgh Journal of Science* (No. 5877).

LONDON AND EDINBURGH PHILOSOPHICAL MAGAZINE. Conducted by David Brewster, Rich. Taylor and Rich. Phillips. New and united series of the *Philosophical Magazine* (from Vol. 7). *Annals of Philosophy and Journal of Science.* (3rd series). 16 vols. (1-16), London, 1832-1840. General index to Vols. 1-12. Third series. London, 1839. 8vo.

LONDON, EDINBURGH AND DUBLIN PHILOSOPHICAL MAGAZINE AND JOURNAL OF SCIENCE. Conducted by David Brewster, Rich. Taylor, Rich. Phillips, and Rob. Kane. New and united series of the *Philosophical Magazine, Annals of Philosophy and Journal of Science.* (3d series.) 21 vols. (17-37.) London, 1840-1850.

LONDON, EDINBURGH AND DUBLIN PHILOSOPHICAL MAGAZINE AND JOURNAL OF SCIENCE. Conducted by David Brewster, Rich. Taylor, Rich. Phillips, Rob. Kane and William Francis. Fourth series. 50 Vols. (1-50). London, 1851-1875.—Fifth series. Edited by Rob. Kane, William Thomson and William Francis; in 1890, Rob. Kane was replaced by G. Fr. Fitzgerald; in 1892, William Thomson's name appears as Lord Kelvin. 50 vols. (1-50). London, 1876-1900.—Sixth Series. Edited by Lord Kelvin, G. Fr. Fitzgerald and William Francis. In 1901 (July), G. Fr. Fitzgerald was replaced by John Joly. Vols. 1-date. London, 1901-date.

5917. **London Electrical Society. Proceedings.** For 1841-1843. Edited by Charles Vincent Walker. 8vo. *London, 1843*
Complete.

5918. **London Electrical Society. Transactions and Proceedings.** For the years 1837-1840. Edited by one of the Committee. 4to. *London, 1841*
Complete.

London Journal of Arts and Sciences.

See *Newton's Journal.* (No. 5932.)

The London Mechanics' Register.

See *New London Mechanics' Register.* (No. 5931.)

5919. **La Lumière Électrique.** Journal universel d'électricité. Applications de l'électricité, lumière électrique, télégraphie et téléphone, science électrique, etc. 4to. *Paris, 1879-1894; 1908-date*
Vols. 1-18, 1879-1885. Now complete by additions from Library file.

Complete in 53 vols. Published monthly from April 15, 1879-Sept. 15, 1879;

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semi-monthly, Oct. 1, 1879-Dec. 15 1880; weekly, Jan. 1, 1881-Aug. 11, 1894; (semi-weekly, July-Dec., 1881). Vol. 53 has only 7 numbers. Vols. 1-10 [1879-1883] have sub-title: *Journal universel d'électricité, revue scientifique illustrée*.

From 1879-1884, edited by Comte Th. Du Moncel; from 1884-1894, Dr. Cornelius Herz was titular directeur. General index, 1879-1883. Paris, 1884. Ceased publication August 11, 1894, and continued September 15 of same year as *L'Eclairage Électrique*. With the issue dated Jan. 4, 1908, the name *La Lumière Électrique* was resumed.

5920. **Magazine of Popular Science and Journal of Useful Arts.** Edited under the direction of the Society for the Illustration and Encouragement of practical science at the Lowther Arcade. 8vo. *London, 1836-1838*
Vols. 1-4. Complete.

Vol. 1, 1836; Vol. 2, 1836; Vol. 3, 1837; Vol. 4, 1838.

5921. **Magazine of Science and Artists', Architects' and Builders' Journal.** L. 8vo. *London, 1840-1852*
Vol. 1, (third edition), 1842.

MAGAZINE OF SCIENCE AND SCHOOL OF ARTS; intended to illustrate the most useful, novel and interesting facts of natural history and experimental philosophy, artistical processes, ornamental manufactures and the arts of life, 11 vols. London, 1840-1849.

MAGAZINE OF SCIENCE AND ARTISTS', ARCHITECTS' AND BUILDERS' JOURNAL. 2 vols. [12, 13]. London, 1850-1851.

MAGAZINE OF SCIENCE AND ARTISTS', ARCHITECTS' AND MINERS' JOURNAL. 2 vols. [14, 15]. London, 1851-1852.

5922. **The Magnet.** A journal of telegraphic gossip and miscellaneous reading. Semi-monthly. Folio. *New York, 1880*
Vol. 1, Feb. 14, 1880-Sept. 15, 1880. Complete.

5923. **Manchester Literary and Philosophical Society, Manchester.** Memoirs and Proceedings of the Manchester Literary and Philosophical Society. (Manchester Memoirs.) 8vo.

London, 1785-1887; Manchester, 1888-date

Vols. 1-3, 1785-1790. Now complete by additions from Library file.

MEMOIRS of the Literary and Philosophical Society of Manchester. Series I, 5 vols., 1785-1802. (Library Vol. 1 is second edition, 1789). Series II, 15 vols., vi-xx, 1805-1860. Series III, 10 vols., xxi-xxx, 1862-1887. For the years 1882-1887 the title reads: *Memoirs* of the Manchester Literary and Philosophical Society.

PROCEEDINGS of the Manchester Literary and Philosophical Society. Vols. 1-26, 1857-1887.

MEMOIRS AND PROCEEDINGS of the Manchester Literary and Philosophical Society. Series IV, Vols. 1-10; from Vol. 11, numbered as Vol. 41, 1888-1896. With Vol. 41 the numbering by series is discontinued and each memoir is separately paged.

MEMOIRS AND PROCEEDINGS of the Manchester Literary and Philosophical Society. (Manchester Memoirs.) Vols. 41-51, 1896/97-date.

An index to the seventeen vols. of the *Memoirs*. Vol. 1 (old series) to Vol. 12 (new series) inclusive, is included in Vol. 12, second series, pp. 285-

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318.—Second series, Vol. 13, 1856, has added to title-page: *Memoir of John Dalton, and history of the atomic theory up to this time.* By Robt. Angus Smith.—Third series, Vol. 9, 1883 has title: *For the hundredth year of the Literary and Philosophical Society of Manchester.* [1881]. A centenary of science in Manchester. By R. Angus Smith.—Fourth series, Vol. 6, 1892, has title: *Memoir of James Prescott Joule.* By Osborne Reynolds.

5924. **The Mechanics' Magazine and Journal of Engineering, Agriculture, Machinery, Manufactures and Ship Building.** 8vo and 4to. *London, 1823-1873*

Vols. 1-29, 31-69, 1823-1858.

MECHANICS' MAGAZINE, MUSEUM, REGISTER, JOURNAL AND GAZETTE: A weekly devoted to the accumulation of useful knowledge pertaining to mechanics. 69 vols. London, 1823-1858. 8vo.

Editors: 1823-Sept., 1852, J. C. Robertson; Oct., 1852-June, 1857, R. A. Brooman; July, 1857-Dec., 1858, R. A. Brooman and E. J. Reed.

THE MECHANICS' MAGAZINE AND JOURNAL OF ENGINEERING, AGRICULTURE, MACHINERY, MANUFACTURES AND SHIP-BUILDING. Weekly. 1859-1871. New series. 28 vols. 4to. The size of Vol. 13, 1865, was increased to small folio.

Editors: Jan., 1859-1860, R. A. Brooman and E. J. Reed; 1870-March, 1871, H. Gardner.

THE MECHANICS' MAGAZINE AND . . . JOURNAL OF SCIENCE, ARTS AND MANUFACTURES. July, 1871-Jan. 4, 1873.

Continued from 1873 as *IRON:* A journal [later "an illustrated weekly journal"] of science, metals and manufactures. Jan. 18, 1873-1891. From Jan., 1892-June, 1892. *Iron:* An illustrated weekly journal for iron and steel manufacturers.

In June, 1893, *Industries* absorbed *Iron* and continued as *Industries and Iron.*

5925. **Military Telegraph Bulletin.** Monthly. 4to. *London, 1884-1889*
Nos. 1-65. Complete.

MILITARY TELEGRAPH BULLETIN. For private circulation only. Nos. 1-4. March 15-June 15, 1884.

MILITARY TELEGRAPH BULLETIN. Nos. 5-36. July 15, 1884-Feb. 15, 1887.

MILITARY AND CIVIL SERVICE TELEGRAPH BULLETIN. Nos. 37-46, March 15, 1887-Dec. 15, 1887.

MILITARY TELEGRAPH BULLETIN. Nos. 47-64. Jan. 16, 1888-June 15, 1889. No issues for July and August, 1889. No. 65, Sept. 16, 1889, last issue.

5926. **Monthly Magazine.** Edited by J. A. Heraud, B. E. Hill and others. 8vo. *London, 1796-1843*
Vols. 1-46, 1796-1819.

MONTHLY MAGAZINE AND BRITISH REGISTER. 63 vols., Feb., 1796-Jan., 1826.

MONTHLY MAGAZINE; or *British Register of Literature, Sciences and the Belles-Lettres.* New series. 18 vols., 1826-1834; New series (again), 1 vol. in 1835.

MONTHLY MAGAZINE OF POLITICS, LITERATURE AND THE BELLES-LETTRES. Vols. 20-26, 1835-1838.

MONTHLY MAGAZINE. Edited by J. A. Heraud, B. E. Hill and others. 9 vols., 1839-1843.

Vols. 7-9 of the last series are described on the title-pages as Vols. 96-98, thus referring back to beginning of the publications.

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5927. **National Telegraph Review and Operator's Companion.** Edited by James D. Reid. 8vo. *Philadelphia and New York, 1853-1854*
Vol. 1, No. 2. 1853.
Four numbers only were issued.
5928. **La Natura.** Revista mensile, diretta da Rodolfo Cappanera. Monthly. *Florence (later Naples), 1877-1881*
Vols. 1-4. Complete.
L'ELETTRICITA. Revista mensile diretta da L. Cappanera. Monthly. Vols. 1 and 2, Jan. 2, 1877-Dec., 1878. Florence. Vol. 1, 4to and Vol. 2, 8vo.
LA NATURA. Revista quindicinale. Vol. 3, Florence, 1881, 8vo.
LA NATURA. Revista mensile. Vol. 4, Naples, 1881, 8vo.
5929. **Naturae Novitates.** Bibliographie neuer Erscheinungen aller Laender auf dem Gebiete der Naturgeschichte und der exacten Wissenschaften. Herausgegeben von R. Friedlaender und Sohn. Semi-monthly. 8vo. *Berlin, 1879-date*
Vols. 1-13, 1879-1891.
Issued annually in a volume of about 700 pages, with classified index.
5930. **Nature.** A weekly illustrated journal of science. Edited by J. N. Lockyer. 8vo. *London, 1869-date*
Vols. 1, 2, 4-57, 1869-1897. Partially completed by additions from Library file.
5931. **New London Mechanics' Register and Magazine of Science and the Useful Arts.** 8vo. *London, 1824-1828*
Vols. 1-4 and New Series, Vols. 1, 2, 1824-1826, 1827-1828. Complete.
THE LONDON MECHANICS' REGISTER. Weekly. 4 vols. Nov. 6, 1824-Nov. 4, 1826.
NEW LONDON MECHANICS' REGISTER AND MAGAZINE OF SCIENCE AND THE USEFUL ARTS. Reports of the lectures at the London Mechanics' Institution. 2 vols., 1827-1828.
5932. **Newton's Journal of Arts and Sciences.** 8vo. *London, 1820-1869*
New Series, vols. 1-23, 1855-1866.
LONDON JOURNAL OF ARTS AND SCIENCES. Containing reports of all new patents, with a description of their respective principles and properties; also original communications on subjects connected with science and philosophy, particularly such as embrace the most recent inventions and discoveries in practical mechanics. By W. Newton. 14 vols., 1820-1828. Second series, 9 vols. (1-9), by W. Newton and C. F. Partington. London, 1828-1832.
Newton's name does not appear on the first 2 vols. of series I. Series II, Vols. 1-5, 1822-1828, are edited by W. Newton and C. F. Partington; Vols. 6-9, 1828-1832 is edited by W. Newton alone.
THE LONDON JOURNAL OF ARTS AND SCIENCES, and Repository of Patent Inventions. London. A union of *The London Journal of Arts and Sciences,* and *The Repository of Patent Inventions* (No. 5943). Conducted by W. Newton. Conjoined series, or, third series. Vols. 1-22. London, 1832-1843.
The word "manufacture" was inserted after "science" in Vol. 22.
NEWTON'S LONDON JOURNAL OF ARTS AND SCIENCES: Being a record of the progress of inventions as applied to the arts. Established in the year 1820. London. New Series, 23 vols. (1-23). London, 1855-1866.

CATALOGUE OF WHEELER GIFT

Analogical index to Vols. 1-23, first and second series. By W. Newton. London, [1834?] 8vo.

Alphabetical index to the names of patentees in first and second series London, n. d., 8vo.

Extra publication: Letters and suggestions upon the amendment of the laws relative to patents for inventions; being a series of communications originally published in the *London Journal of Arts and Sciences*; together with papers and documents connected with the reform of the patent law. London, [1835] 8vo.

New York Review of the Telegraph and Telephone and Electrical Journal.

See *Electrical Review*, New York. (No. 5886.)

Nicholson's Journal of Natural Philosophy, Chemistry and Arts.

See *Journal of Natural Philosophy*. (No. 5912.)

5933. **Operator, The.** Semi-monthly. 4to and L. folio.

New York, 1874-1885

Vols. 9-16. Now complete by gift of Mr. W. J. Johnston.

THE OPERATOR. Semi-monthly. Vol. 1, March 1, 1874-Aug. 15, 1874.—The telegraph operators' journal. Semi-monthly. Vols. 2, 3; Vol. 4, Nos. 1-8, Sept. 1, 1874-Dec. 15, 1875.—A journal of scientific telegraphy. Semi-monthly. Vol. 4, No. 9-end. Vol. 5 and Vol. 6, Nos. 1-6, Jan. 1, 1876-Nov. 15, 1876.—A journal of scientific and practical telegraphy. Semi-monthly. Vol. 6, No. 7-end; Vols. 7-10; Vol. 11, Nos. 1-20, Dec. 1, 1876-Oct. 15, 1880.—A journal of telegraphic, telephonic and electrical science, literature, news and progress. Semi-monthly. Vol. 11, Nos. 21-end and Vols. 12, 13, Nos. 1-22. Nov. 1, 1880-Oct. 14, 1882. Weekly. Vol. 13, Nos. 21-31, Oct. 21, 1882-Dec. 30, 1882.

THE OPERATOR AND ELECTRICAL WORLD. A Journal for telegraphists, telephonists, electricians and electrical engineers. Weekly. Vol. 14, Nos. 1-16, Jan. 6, 1883-April 21, 1883. L. folio.

THE OPERATOR. A journal of telegraphic literature, news and miscellaneous reading. Semi-monthly. Vols. 14-16, May 1, 1883-Sept. 19, 1885. L. folio.

For continuation, see *Electrical World*, (No. 5887).

5934. **Our Magazine.** A monthly periodical. 12mo.

Edinburgh, 1855-1856

Vol. 1. Complete.

Contains original articles chiefly contributed by the officials of the Electric and International Telegraph Company.

5935. **Penny Mechanic and the Chemist.** 8vo. *London, 1836-1842*
Vol. 3, 1838.

PENNY MECHANIC. A magazine of the arts and sciences. Vol. 1, Nos. 1-37, Nov. 5, 1836 to July 8, 1837.

PENNY MECHANIC AND THE CHEMIST. A magazine of the arts and sciences. Vol. 1, Nos. 38-40, July 15-July 29, 1837; Vols. 2-6; new series, Vols. 1, 2 and third series, Vols. 1, 2, also numbered as Vols. 7-9.

Philosophical Magazine.

See *London, Edinburgh and Dublin Philosophical Magazine*. (No. 5916.)

Photographic Journal.

See *Photographic Society*. (No. 5936.)

5936. **Photographic Society of London.** 8vo. *London, 1853-date*

Vol. 1, March 3, 1853-June 30, 1854.

PHOTOGRAPHIC SOCIETY OF LONDON. Journal, containing the

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transactions of the society and a general record of photographic art and sciences. Vols. 1-15, 1853-1873.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. Journal, containing the Transactions of the Society. Vol. 16, 1873-1876.

Editors: Vols. 1, 2, A. Henfrey; Vol. 3, J. R. Major; Vol. 4, W. Crookes; Vols. 5-12, H. W. Diamond; Vol. 13, H. W. Diamond and J. Spiller; Vol. 14, J. Spiller; Vols. 15, 16, J. Spiller and H. B. Pritchard.

PHOTOGRAPHIC JOURNAL, including the Transactions of the Photographic Society of Great Britain (later the Royal Photographic Society of Great Britain). New series. Vols. 1-date. 1876-date.

The Society was instituted in 1853.

5937. **Physical Society of London. Proceedings.** 8vo.

London, 1876-date.

Vols. 1-13, 1876-1895. Now complete by additions from Library file.

Vol. 1. March 21, 1874-June 26, 1875.—Vol. 2. Nov., 1875-Dec., 1878.—Vol. 3, Jan., 1879-July, 1890.—Vol. 4. Aug., 1880-Dec., 1881.—Vol. 5, Jan., 1882-March, 1884.—Vol. 6. April, 1884-Febr., 1885.—Vol. 7. Febr., 1885-Jan., 1886.—Vol. 8. Febr., 1886-April, 1887.—Vol. 9. April, 1887-June, 1888.—Vol. 10. June, 1888-June 1890.—Vol. 11. June, 1890-June, 1892.—Vol. 12. Oct., 1892-Jan., 1894.—Vol. 13, Jan., 1894-Oct., 1895.—Vol. 14. Oct., 1895-Oct., 1896.—Vol. 15. Oct., 1896-Oct., 1897.—Vol. 16. Oct., 1897-Oct., 1899.—Vol. 17. Oct., 1899-Dec., 1901.—Vol. 18. April, 1902-Dec., 1903.—Vol. 19. May, 1904-Dec., 1905.—Vol. 20. Dec., 1905-Dec., 1907.

Abstract of physical papers from foreign sources. Vols. 1-3 (edited by J. Swinburne). London, 1895-1897.

The Physical Society of London was founded 1874.

5938. **Polytechnic Journal.** A monthly magazine of art, science and general literature. 8vo. *London, 1839-1844*

Vols. 1-6, Sept., 1839-June, 1842.

POLYTECHNIC JOURNAL is complete in 8 vols. and continued as: *London, Edinburgh and Dublin Polytechnic Journal*. New Series, Vols. 1, 2, 1843-1844.

Part of Vol. 2 of *Polytechnic Journal*, was republished under the title: *The London Polytechnic Journal*, No. 1, 1840; also the *Polytechnic Magazine*, No. 1, Jan., 1840; also the *Polytechnic Review*, No. 1, Jan., 1840.

5939. **Postal, Telegraphic and Telephonic Gazette.** Weekly. Folio. *London, 1883*

Vol. 1, Aug. 3, 1883-Aug. 1884. Complete.

5940. **Practical Mechanics' Journal.** 8vo and 4to.

Glasgow and London, 1848-1870

Vols. 1-7, 1848-1855.

A complete set comprises three series: Series I, 8 Vols., 1848-1856. Series II, 9 Vols., (9-17) Glasgow, London, 1856-1865. Series III, 5 vols., (18-22), London, Glasgow, 1865-1870. Glasgow (later) London, 1848-1870.

Editors: W. and J. H. Johnson.

Illustrated index [to Vols. 1-6], to which is added concise information relative to patents, by W. and J. H. Johnson. London, 1854.

THE PRACTICAL MECHANICS' JOURNAL record of the Great Exhibition, 1862. London, 1862. 4to.

The *Journal* succeeded *Practical Mechanics' and Engineers' Magazine*. First series, Vols. 1-4, 1841-1845. Second series, Vols. 1-2, (5-6), 1845-1847. Glasgow, 1842-1847. 4to.

Quarterly Journal of Science, Literature and the Arts.

See *Royal Institution of Great Britain, Journal*. (No. 5946.)

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5941. **Register of the Arts and Sciences.** Containing a correct account of several hundred of the most important and interesting inventions, discoveries and processes. 8vo.

London, 1824-1827

Vols. 1-4. Complete.

Continued as: *Register of Arts and Journal of Patent Inventions.* Being an improved series and a continuation of *The Register of the Arts and Sciences.* Edited by L. Hebert. 7 vols. London, 1828-1832. 8vo.

5942. **Repertorium der Physik.** Enthaltend eine vollstaendige Zusammenstellung der neuern Fortschritte dieser Wissenschaft. Unter Mitwirkung der Herren Beetz, Broch, Jacobi, Knochenhauer, Lamont, Lejeune-Dirichlet, Mahlmann, Minding, Moser, Neumann, Radicke, Riess, Roeber, Seebeck und Strehlke herausgegeben von Heinrich Wilhelm Dove und Ludwig Moser. 8vo.

Berlin, 1837-1849

Vols. 1-8. Complete.

The title of Vols. 6-8 varies slightly. The editor's name does not appear on the title-page of Vols. 6-8; on title-page of Vols. 2-5, Hrsg. H. W. Dove. *Contents:* Vol. 1, 1837. I. Allgemeine Physik, (von H. W. Dove). II. Mathematische Physik. Ueber die Darstellung ganz willkuerlicher Functionen durch Sinus—und Cosinus—Reihen von L. Dirichlet. III-VI. Galvanismus. Elektromagnetismus, Magneto-Elektricitat, Thermo-Magnetismus (von L. F. Moser). Vol. 2, 1838. VII. Lehre von der Elektricitat von F. Riess. VIII. Magnetismus und einige Nachtraege zum Galvanismus und zum induzirten Magnetismus von L. Moser. Literatur der Optik von H. W. Dove. Vol. 3, 1839. IX. Akustik von A. Roeber und F. Strehlke. X. Theoretische Optik von (G.) Raedicke. XI. Meteorologie (von H. W. Dove). Vol. 4, 1841. XI. [Continuation] Meteorologie (von W. Mahlmann und H. W. Dove). XII. Waerme (von H. W. Dove). Vol. 5, 1844. XIII. Mechanik, bearbeitet von F. Minding. XIV. Allgemeine Gesetze der Wellenbewegung von O. J. Broch. XV. Literatur des Magnetismus und der Elektricitat von H. W. Dove. XVI. Ueber das Auge von L. Moser. Vol. 6, 1842. I. Akustik von A. Seebeck. II. Die Lehre von der Elektricitat. [2. Bericht] von P. Reiss. Vol. 7, 1846. XVII. Besondere Gesetze der Wellenbewegung von O. J. Broch. XVIII. Allgemeine Physik von (K. W.) Knochenhauer. XIX. Magnetismus der Erde [2. Bericht] von J. Lamont. Vol. 8 [1849]. XX. Galvanismus von W. Beetz. XXI. Akustik von A. Seebeck.

These eight volumes form a continuation to Fechner's (Gustav Theodor) *Repertorium der Experimentalphysik:* Enthaltend eine Zusammenstellung der neueren Fortschritte dieser Wissenschaft. Vols. 1-3 (no more published). Leipzig, 1832. L. 8vo. (No. 865).

5943. **The Repertory of Patent Inventions,** and other discoveries and improvements in arts, manufactures and agriculture; being a continuation on an enlarged plan, of the Repertory of Arts and Manufactures. Monthly. 8vo. London, 1794-1862 Vols. 1-16, 1794-1802; second series, Vols. 1-45, 1802-1825; new series, Vols. 1-4, 6-9, 11-18, 1834-1842; enlarged series, Vols. 1-40, 1843-1862.

Founded as *Repertory of Arts and Manufactures*, consisting of original communications, specifications of patent inventions. Vols. 1-16, June, (?) 1794-May, (?) 1802.

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REPERTORY OF ARTS, MANUFACTURES AND AGRICULTURE.
Consisting of original communications, specifications of patent inventions.
Second series. Vols. 1-46, June, 1802-June, 1825.

REPERTORY OF PATENT INVENTIONS and other discoveries and improvements on art, manufactures and agriculture; being a continuation, on an enlarged plan, of the *Repertory of Arts and Manufactures*. Third series, Vols. 1-16, July, 1825-Dec., 1833. New series, Vols. 1-18, Jan., 1834-Dec., 1842. Enlarged series, Vols. 1-40, Jan., 1843-Dec., 1862.

An Analytical Index to the sixteen volumes of the first series of the *Repertory of Arts and Manufactures*: being a condensed epitome of that work; accompanied by alphabetical lists of authors and patentees and of all patents granted for inventions from 1795 to April, 1802. To which is added a general index to the first eight volumes of the second series. London, 1846.

A general index of the *Repertory of Patent Inventions* from 1815-1845, inclusive. London, 1846.

Index to all patents granted in England, from 1815-1845, inclusive, being an appendix to the general index of the *Repertory of Arts*, etc., during those periods. London, 1849.

Index to all patents granted in England from 1846-1850, inclusive. London, 1850.

Index of patentees for January to December, 1851. Index of inventions from January to December, 1851. Index to the *Repertory of Arts*, etc. Vols. 17 and 18, 1851. London, 1852.

The volumes up to 1825 bear as imprint: Printed for G. and T. Wilkie; and up to 1862, Published for the Proprietors by T. and G. Underwood. The index published in 1807 has the imprint, Printed for J. Watt; and the indexes of 1846 and 1849: Published for the Proprietor by A. Macintosh.

Review of the Telegraph and Telephone.

See *Electrical Review*, New York. (No. 5886.)

5944. **Revue Internationale de L'Électricité et de ses Applications.**
Directeur: A. Montpellier. 4to. *Paris, 1885-1890*
Nos. 109, 112, 116, 117, 119, 120, (1890).
Complete in 120 Nos. Years 1-6, or Vols. 1-11, 1885-1890. Incorporated with *l'Électricien* (No. 5890) in Dec., 1890.

5945. **La Rivista Telegrafica.** *Naples, 1881- ?*
Vol. I, 1881-1882.

5946. **Royal Institution of Great Britain. Journal.** Quarterly. 8vo.
London, 1816-1831
Vol. 23, April-June, 1828. Now complete, except Vols. 13, 23-29 and 1, 2, by additions from Library file.
JOURNAL OF SCIENCE AND THE ARTS. Edited at the Royal Institution of Great Britain. Quarterly. Vols. 1-6. London, 1816-1819.
QUARTERLY JOURNAL OF SCIENCE, LITERATURE AND THE ARTS. Vols. 7-29. London, 1819-1830.
ROYAL INSTITUTION OF GREAT BRITAIN. JOURNAL. Vols. 1, 2, Oct., 1830-Nov., 1831. London, 1831.
Other publications of the Royal Institution:
Notices of the Proceedings at the Meetings of the Members of the Royal Institution of Great Britain; with abstracts of the Discourses delivered at the Evening Meetings. Vols. 1-17. London, 1854/5-1902/4.
Index to Vols. 1-4 in Vol. 4, 1862/6 [pp. 597-610]. Index to Vols. 1-12 in Vol. 12, 1887/9, [pp. 581-614].
Established under royal charter 1800; enlarged and confirmed 1810.

5947. Royal Society of London.

1665-date.

Philosophical Transactions abridged, with notes and biographical illustrations. By C. Hutton and others. Vols. 1-18 (complete), 1665-1800. London, 1809. 4to.

Philosophical Transactions and Collections Abridged and disposed under general heads. 10 vols. in 11. (1665-1750.) London, 1722-1856. 4to.

By gift of Mr. Edward D. Adams the Library now possesses a complete set of the **Philosophical Transactions** and the **Proceedings** of the Royal Society, the **Catalogue of Scientific Papers** and various **Histories** of the Society.

PHILOSOPHICAL TRANSACTIONS, giving some account of the present undertakings, studies and labors of the ingenious in many considerable parts of the world. Vols. 1-65, London, 1665-1775. Small 4to.

The first five volumes went through several editions between 1705 and 1781. The first three volumes were originally edited by Lowthrop; 4 and 5 by Jones; 6 by Reid and Gray; 7 and 8 by Eames and Martyn.

Editors: 1665-June, 1677, Nos. 1-136, H. Oldenburg; Jan., 1678-Febr., 1679, Nos. 137-142, N. Grew; 1683-1684, Nos. 143-166, R. Plot; 1685, Nos. 167-178, W. Musgrave; 1686-1687, Nos. 179-191, E. Halley; 1691-1694, Nos. 192-214, R. Waller; 1695-1713, Nos. 215-237, Sir H. Sloane; 1714-1719, Nos. 338-363, G. Halley; 1720-1727, Nos. 364-398, J. Jwin; 1727-1728, Nos. 399-406, W. Ruty; 1729-1750, Nos. 407-497, C. Mortimer.

PHILOSOPHICAL TRANSACTIONS. Vols. 66-81, London, 1776-1791. Small 4to.—For 1792-1852 (no vol. Nos.), 62 vols. Large 4to.—Vols. 143-date. After 1866, Vol. 177, published in two series: A. Mathematical and Physical—B. Biological. Large 4to.

The printing of the *Philosophical Transactions* from time to time was under the supervision of the respective secretaries to the 47th vol. From this period, 1751, the *Transactions* were published under the superintendence of a Committee of the Society.—The title *Transactions* was changed to *Collections* for one volume, 13, 1678. From Vol. 14, 1682, the old title *Transactions* was resumed.—No volumes were published for the years, 1679-1682, but the deficiency is partially supplied by *Philosophical Collections* by R. Hooke, Nos. 1-7. Small 4to.—There were no volumes for 1688-1690, and included in Vol. 16 are all that were published for 1691 and 1692, viz., Nos. 192 to 195, which are paged 451-578.—From 1751-1762 only one half volume was issued annually, and from 1763-1895 a complete volume, consisting of two or more parts, was issued annually.—In 1791 the word "Volume" and the number in Roman numerals were dropped and the vols, numbered by the year; the serial number was taken up again with Vol. 143.—Vols. 41, 44, 48-52, 57, 59, 61, 63-date are in two parts, excepting Vols. 90, 109, 114, 119, 143, 146, 147, 151, 154, 171, 172, 174, which are each in three parts, and Vols. 116, 136, 173 each in four parts.—A general index: or alphabetical table to all the *Philosophical Transactions*, from Jan. 1677/78—Dec., 1693; and a catalogue of the books mentioned in the *Transactions*. London, S. Smith and B. Walford, 1694. (Appended to Vol. 17, 1693, of the *Philosophical Transactions*.)—A general index to the *Philosophical Transactions* from the first to the end of the seventieth volume, 1665-1780. By Paul Henry Maty. 802 pp. London, L. Davis, 1787. 8vo.—A continuation to the alphabetical index of the matter contained in the *Philosophical Transactions*, from Vol. 71 to Vol. 90, 1781-1820. London, W. Bulmer and W. Nicol. 225 pp. 4to.—A continuation of the alphabetical index from 111-120. 1821-1830. 101 pp. London, R.

CATALOGUE OF WHEELER GIFT

Taylor, 1833. Folio.—An index to the anatomical, medical, surgical and physiological papers contained in the *Transactions* of the Royal Society from the commencement of that work to the end of the year 1813. Chronologically and alphabetically arranged. 101 pp. Westminster, M. Stace, 1814. 4to. (Preface signed J. B., i.e., James Briggs.)

Supplements: Vol. 43, 1744-5. The Crounian lectures on muscular motion. 1744-1745. Read before the Society by James Parsons. 86 pp., pl. London, C. Davis, 1745. 8vo.—Vol. 44, part I, 1746. Human physiognomy explained: Crounian lectures on muscular motion, 1746. Read before the Society by James Parsons. 2 p. l. 8+82 pp., pl. London, C. Davis, 1747, 8vo.—Vol. 44, Part II. The Cronean lectures on muscular motion by Browne Langrish. Read before the Society, 1747. 66 pp. London, C. Davis, 1748, 8vo (with Vol. 44, Part II, of the *Philos Trans.*).

MISCELLANEA CURIOSA, containing a collection of some of the principal phenomena in nature. . . . discourses read and delivered to the Royal Society. Revised and corrected by W. Derham. Vol. I, third edition. London, 1726. 8vo. (Wheeler Gift.) Complete in 3 vols.; first edition, 1705-1707; second edition, 1708-1727; a third edition of Vol. I was published in 1726.

MEMOIRS OF THE ROYAL SOCIETY, being a new abridgment of the *Philosophical Transactions*. Vols. 1-5, 8, 9. From 1665-1740. Second edition. London, 1745. 8vo. (Vols. 3 and 4 are first edition, 1739.) (From Library file. Complete in 10 vols., first edition published 1738-1741.)

ABSTRACT OF THE PAPERS printed in the *Philosophical Transactions*. Vols. 1-4, 1800-1843. London, 1832-1843. 8vo. Continued as

ABSTRACT OF THE PAPERS communicated to the Royal Society. Vols. 5, 6, 1843-1854. London, 1851-1854. 8vo. Vols. 3-6 are also entitled in text *Proceedings* Nos. 1-102.

PROCEEDINGS OF THE ROYAL SOCIETY, being a continuation of the series entitled "Abstracts of the Papers" communicated to the Royal Society of London. Vols. 7-date. Febr. 23, 1854-date. London, 1856-date. With Vol. 76, 1905, the *Proceedings* are enlarged to super-royal 8vo and issued in two series, A and B, corresponding with the *Philosophical Transactions*. (Series A and B begin with No. 534.)

CATALOGUE OF SCIENTIFIC PAPERS. 1800-1883. Compiled and published by the Royal Society of London. Vols. 1-12. London, 1867-1902. 4to. Vols. 1-6 for 1800-63; Vols. 7-8 for 1864-1873; Vols. 9-11 for 1874-1883; Vol. 12, supplement. Superseded in 1903 by the International Catalogue of Scientific Literature, of which the Library contains a set to date, the gift of Mr. Edward D. Adams, covering the sections of physics, mechanics, chemistry and mathematics.

BIRCH, THOMAS. (1705-1766.) *HISTORY OF THE ROYAL SOCIETY*, in which the most considerable of those papers communicated to the Society which have not been published are inserted in their proper order as a supplement to the *Philosophical Transactions*. 4 vols. London, 1756-1757. 4to.

HILL, SIR JOHN. (1716?-1775.) *REVIEW OF THE WORKS OF THE ROYAL SOCIETY*. Containing animadversions on such of the papers as deserve particular observation. In 8 parts. Second edition. (First edition, 1751.) viii+265 pp. London, 1780. 4to.

"An attempt to place the Royal Society and their Transactions in a ludicrous light, because the body would not admit him a member." (Lowndes.)

SPRAT, THOMAS. (1635-1713.) *HISTORY OF THE ROYAL SOCIETY*, for improving of Natural Knowledge. 438 pp. London, 1667. 8vo.

THOMSON, THOMAS. (1773-1852.) *HISTORY OF THE ROYAL SOCIETY*, from its Institution to the end of the XVIII century. 552 pp. London, 1812. 4to.

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WELD, CHARLES RICHARD. (1813-1869.) *A HISTORY OF THE ROYAL SOCIETY*, with memoirs of the Presidents, compiled from authentic documents. 2 vols. London, 1847. 8vo.

RECORD OF THE ROYAL SOCIETY OF LONDON. Second edition. London, 1901. 8vo. (First edition published in 1897.)

Royal Photographic Society of Great Britain.

See Photographic Society of London.

5948. **St. Martin's Magazine.** Monthly. 8vo. *London, 1874-1875*

Vol. 1, Nos. 9-12, Sept.-Dec. 1875.

Only one vol. published. Incorporated with *The Telegraphist* (No. 5963), in 1876.

5949. **Science.** A weekly journal devoted to the advancement of science, publishing the official notices and proceedings of the American Association for the Advancement of Science. 4to. Small folio.

New York, Cambridge (Mass.), New York, 1880-date.

Vols. 1-4, 1883-1884. Now complete by additions from Library file, except Vols. 1-3 (1880-1882) 10-23 and new series Vols. 1-6, 9 and 10.

SCIENCE. A weekly record of scientific progress. Illustrated. Edited by John Michels. Vols. 1-3, July, 1880-March, 4, 1882, or Nos. 1-82. 4to. New York. Vol. 3 consists only of 3 Nos., dated Jan. 14, 21 and March 4.

SCIENCE. An illustrated journal published weekly. Vols. 1-23, Feb., 1883-March 23, 1894. The first 5 vols. were published in Cambridge, Mass., and the remainder in New York. The size changed to small folio from Vol. 10 to the end of the old series. No title-page and index published to Vols. 22 and 23.

SCIENCE. A weekly journal devoted to the advancement of science. New series. Vols. 1-date, Jan., 1895-date. Size changed again to 4to. Sub-title reads from Vol. 13, 1901: A weekly journal devoted to the advancement of science, publishing the official notices and proceedings of the American Association for the Advancement of Science.

5950. **Scientific American.** Folio. *New York, 1845-date.*

Vols. 40 to 54, 56 and 57. Now complete by gift of *Electrical World* and additions from Library file, except old series I, 14 vols. and Vols. 55, 59 and 77 of new series.

SCIENTIFIC AMERICAN. The advocate of industry and journal of scientific, mechanical, and other improvement. 14 Vols. Folio; Vol. 1, in imp. folio. New York, Aug., 1845-June, 1859.

SCIENTIFIC AMERICAN. A journal of practical information in art, science, mechanics, agriculture, chemistry and manufactures. New series. Vols. 1 to date. New York, July, 1859-date.

Edited 1845-1871 by Salem H. Wales; afterward by O. D. Munn and A. E. Beach.

SEPARATE PUBLICATIONS

SCIENTIFIC AMERICAN EXPORT EDITION. Monthly. Folio. Vols. 1 to date. New York, 1878 to date.

SCIENTIFIC AMERICAN BUILDING EDITION. Monthly. Folio. New York, 1885-1905. Vols. 1-39. The years 1885-1894. Vols. 1-18, are also called: Architects' and Builders' Edition. In June, 1905, (Vol. 39, No. 6) superseded by *American Homes and Gardens*.

AMERICA CIENTIFICA E INDUSTRIAL. Monthly. Folio. Vols. 1 to date. Nueva York, 1890-date.

CATALOGUE OF WHEELER GIFT

5951. **Scientific American Supplement.** (2 vols. per year). Folio.
New York, 1876-date
 Now complete, except Vols. 23, 25, 26 and 27, by gift of Mr. Edward D. Adams.
 There are two indexes, as follows: Catalogue of valuable papers contained in the *Scientific American Supplement*, 1876-1902, and another covering the years, 1876-1905. New York, 1903 and 1906.
5952. **Scientific Gazette; or Library of Mechanical Philosophy, Chemistry and Discovery.** Edited by C. F. Partington. 4to.
London, 1825-1826
 Nos. 1-18, July 2, 1825-Oct. 29, 1825. Complete in 2 vols. consisting of 31 numbers.
5953. **Scientific Memoirs**, selected from Transactions of foreign academies of science and learned societies and from foreign journals. Edited by Richard Taylor. 8vo. *London, 1837-1852*
 Vols. 1-5.
 Vol. 1, 1837; Vol. 2, 1841; Vol. 3, 1843; Vol. 4, 1847; Vol. 5, 1852. Vols. 1-4 printed by R. and J. E. Taylor and Vol. 5 by Taylor and Francis. Vols. 1-4 each in 4 parts and Vol. 5 in 5 parts.
 After Vol. 5 the publication was continued in two divisions, as follows:
SCIENTIFIC MEMOIRS: Natural History. New series, Vol. 1, parts 1-4. Edited by A. Henfrey and T. H. Huxley. 1852-1853. Only one volume published.
SCIENTIFIC MEMOIRS: Natural Philosophy. New series. Vol. 1, parts 1-4. Edited by John Tyndall and W. Francis. 1852-1853. Only one volume was published.
5954. **Shaffner's Telegraph Companion.** Devoted to the science and art of the Morse telegraph. By Tal. P. Shaffner. Monthly and quarterly. 8vo. *New York, 1854-1855*
 Vols. 1, 2. Complete.
 Vol. 1 is complete in 6 numbers, Jan.-June; Vol. 2 in 4 numbers. There are no issues from July-Dec., 1854. Vol. 1 has a portrait of Sam. F. B. Morse and Vol. 2 of Tal. P. Shaffner. The first number of Vol. 2 consists of Morse's defense against charges of Prof. Henry, with index. (See No. 5857.)
5955. **Société Internationale des Électriciens. Bulletin.** Monthly. 8vo. *Paris, 1884-date*
 Vols. 1-8, 1884-1891. Now complete by additions from Library file.
 A complete set comprises Vols. 1-17, 1884-1899; New series. Vols. 1-date. 1900-date.
 Table générale des matières. First series. 1884-1900. Supplément au Bulletin mensuel, No. 13 (Second series) March, 1902.
5956. **Society of Arts. Society Instituted at London, for the Encouragement of Arts, Manufactures and Commerce; with the Premiums Offered. Transactions.** 8vo. *London, 1783-1849*
 Vols. 1-54, for 1783-1842; Vols. 1, 2 are third editions and Vols. 3-5 second editions.
 A complete set comprises 57 vols. in 8vo, and a supplemental vol. published in 1852, in 4to. Vol. 56 is entitled "Abstracts of Proceedings, etc."

CATALOGUE OF WHEELER GIFT

Vol. 26 contains an analytical index to Vols. 1-25, and Vol. 40, index to Vols. 26-40.

The supplemental volume contains: I. Charter of Incorporation. II. Address of Council. III. Papers read to the Society during the sessions, 1846-1847, 1847-1848. Vols. 1 and 2. London, 1847, 1849. 4to. (Discontinued after this date).

Commonly called the Society of Arts. Founded, 1754. Incorporated, 1847.

5957. **Il Telegrafista.** Rassegna mensile di elettricità, telegrafica, telefonici, etc. 8vo. *Rome, 1881-1889*
Vols. 1-3, 5.

IL TELEGRAFISTA. Vols. 1, 2. Roma, 1881-1882.

IL TELEGRAFISTA. Rassegna mensile di elettricità, telegrafica, telefonici, etc. Vols. 3-9. Roma, 1883-1889. Complete in 9 vols.

5958. **The Telegraph and Railway Era.** A penny weekly commercial journal. An organ also for mining, banking, insurance, steam and other interests. 4to. *London, 1870-1871*
Vol. 1, Nos. 1-7, Dec. 17, 1870-Jan. 28, 1871. Complete.

5959. **Telegraph Electrical Society.** Melbourne. 8vo. *Melbourne, 1875-1881*
Transactions. Vol. I.—Journal. Vol. II. Complete.

Transactions. Vol. 1, Nos. 1-13, 1874-1878. Journal. Vol. 2, Nos. 14-18, 1879-1881.

The Journal is a continuation of the Transactions. Transactions, Vol. 1, Nos. 1-13, Aug. 8, 1874-Oct. 2, 1878. Journal, Vol. 2, Nos. 14-18, Oct., 1878-Dec., 1880.

5960. **The Telegrapher.** 4to. *New York, 1864-1877*
Vols. 4, 5, 9-13, 1867-1877. Now complete by gift of the McGraw Publishing Company.

THE TELEGRAPHER. Published by the National Telegraphic Union. Vols. 1-6, Nos. 1-214. Monthly from Oct. 16, 1864-Aug. 15, 1867; weekly from Aug. 31, 1867-Aug. 20, 1870.

THE TELEGRAPHER. A journal of electrical progress. Edited by J. N. Ashley. Vols. 7-13, Nos. 215-546. Weekly. Aug. 27, 1870-Feb. 3, 1877. Vol. 13 consists only of five numbers.

United in 1877 with *Journal of the Telegraph* (No. 5913).

5961. **Telegraphic Journal.** A weekly record of electrical progress. 4to. *London, 1864*
Vols. 1-2, Jan. 2, 1864-Dec. 24, 1864. Complete.

Telegraphic Journal and Electrical Review.—*Telegraphic Journal and Monthly Illustrated Review of Electrical Science.*—*Telegraphic Journal and Monthly Review of Electrical Science.* See *Electrical Review*, London. (No. 5885.)

5962. **The Telegraphist.** A monthly journal of popular electrical science. Edited by W. Lynd. 4to. *London, 1883-1886*
Vols. 1-3. Complete.

THE TELEGRAPHIST. A monthly journal for postal, telephone, and railway telegraph clerks. Vol. 1, Nos. 1, 2. Dec. 1, 1883-Jan. 1, 1884.—A monthly journal for postal, telephone, cable, and railway telegraph clerks.

CATALOGUE OF WHEELER GIFT

Vol. 1, Nos. 3-6, Febr. 1, 1884-May 1, 1884.—A monthly journal of popular electrical science. Vol. 1, Nos. 7-end (No. 12). June 1, 1884-Nov. 1, 1884; Vol. 2, Dec. 1, 1884-Nov. 2, 1885. (Nos. 13-24); Vol. 3, Dec. 1, 1885-June 1, 1886. (Nos. 25-31.)

5963. **The Telegraphist and Electrician.** 4to. *London, 1876-1877*
Vol. 1, Nos. 1, 5-12; Vol. 2, Nos. 13-21.

THE TELEGRAPHIST. A literary and scientific journal. Monthly. Vol. 1, Feb., 1876-Dec., 1876.

THE TELEGRAPHIST AND ELECTRICIAN. The journal of the English telegraph staff. Vol. 2, Jan., 1877-Sept., 1877.

Consolidation (1876) of *St. Martin's Magazine* and the *Telegraphist* (No. 5948).

5964. **The Telephone.** A review of electrical science. Semi-monthly. Folio. *London, 1889*

Vol. 1, Nos. 1, 3-11, 13-24.

Vol. 1, only was published.

5965. **The Year-Book of Facts in Science and the Arts.** Sm. 8vo.

London, 1838-1881

Years 1839-1845; 1847-1848; 1850; 1855-1856; 1859-1860; 1862; 1874-1875. Year 1868 has been added from Library file.

THE YEAR-BOOK OF FACTS IN SCIENCE AND ART: Exhibiting the most important discoveries and improvements of the past year, in mechanics; natural philosophy; electricity; chemistry; zoology and botany; geology and mineralogy; astronomy; meteorology and geography. Edited by John Timbs. For the years 1838-1873. 35 vols. London, 1839-1874.

THE YEAR-BOOK OF FACTS IN SCIENCE AND THE ARTS. For the years 1874-1880. London, 1877-1881.

Editors: For the years 1874-1875, C. W. Vincent; for 1876-1880, James Mason.

Extra-volume: The Year-book of facts in the great exhibition of 1851; its origin and progress, constructive details of the building, the most remarkable articles and objects exhibited, etc. By John Timbs. 4+348 pp. London, 1851.

Extra-volume: The Year-book of facts in the international exhibition of 1862. 8+354 pp. London, 1862.

Superseded *Arcana of Science and Annual Register of the Useful Arts* (No. 5865).

5966. **Zeitschrift des Deutsch-Oesterreichischen Telegraphen-Vereins.**
Herausgegeben in dessen Auftrage von der Kgl. Preussischen Telegraphen-Direktion. Redigirt von P. W. Brix. Monthly. 4to. *Berlin, 1854-1869*

Years 1-5, 9-13.

Complete in 16 Vols. In 1872 a continuation was published with the title: *Annalen der Telegraphie*, herausgegeben von P. W. Brix. In Anschluss des Deutsch-Oesterreichischen Telegraphen-Vereins. 8vo. Only one number appeared.

APPENDIX

The Sympathetic Telegraph

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The Sympathetic Telegraph



THE books in the following lists contain references to an imaginary magnetic telegraph which occasionally figures in early electrical literature. As first described by Porta, it consists of a pair of magnetic needles mounted on a dial with the letters of the alphabet equally spaced around the circumference, the two needles having been magnetized by the same magnet. When used by two persons distant from each other, a movement of the needle of one instrument was supposed to cause a synchronous movement of the needle of the other instrument.

The sympathetic telegraph was first described in print by Giovanni Battista della Porta in 1558 (No. 47), who is supposed to have obtained the idea from Cardinal Bembo. H. B. Wheatley, in a paper *On the sympathetic telegraph* (No. 4156), says "He [Porta] is said to have derived the idea from Cardinal Bembo, but the observations of that celebrated historian and poet on the subject have not yet been traced."

Pietro Bembo (1470-1547) was a distinguished Italian prelate and scholar of whom Hallam says, "We must place him among the ornaments of literature in the XVI. century." In 1513 he became secretary to Pope Leo X., and in 1529 was appointed historiographer to the Republic of Venice. Shortly afterwards, he was appointed librarian of Saint Mark's, Venice. The cardinal's hat was conferred on him in 1539 by Paul III., who was also a patron of letters and science,

Initial from Porta, 1558; tail-piece from Cabeo, 1629.

and to whom, by permission, Copernicus dedicated his celebrated treatise *De orbium cælestium revolutionibus*, 1543, and Affaitato his *Phisicæ ac astronomicæ considerationes* (No. 27). A posthumous collected edition of the works of Fracastorio (No. 39), author of the extraordinary poem *De morbo gallico*, was, by permission, dedicated to Cardinal Bembo. The complete works of Bembo were published in four volumes in Venice in 1729.

Gilbert in *De magnete* is oddly silent as to the sympathetic magnetic telegraph, although frequent references to Porta indicate that the Colchester philosopher was intimately acquainted with *Magiæ naturalis*. Though on the whole appreciative of the work of Porta, Gilbert criticizes in severe terms some of his statements, and it is surprising that the description of the telegraph failed to incite choleric mention. Galileo in *Systema cosmicum*, 1635 (No. 108), ridicules the sympathetic telegraph. In the course of a dialogue, which form of exposition Galileo usually employed in his writings, a mythical Sagredus is made to say that one had offered to sell him the secret art by which, through the attraction of a certain sympathetic magnet needle, it was possible to converse over a space of two or three thousand miles. Sagredus expressed willingness to become the purchaser provided it were shown that by the means described communication could be carried on between himself and the owner of the secret when stationed in opposite corners of a room, which test was refused on the grounds that in so short a distance the action would be scarcely discernible. The man was then dismissed with the remark that if for the purpose of trying the experiment it was necessary to travel to Egypt or Muscovy, he could himself proceed there if he chose, while the speaker would remain in Venice and attend to the rest.

Cabeo in 1629 gave the first picture of a sympathetic tel-

egraph in his *Philosophia magnetica* (No. 97). It shows a dial with a small-letter alphabet around the outer edge, and a magnetic needle pivoted at the center. Robert Turner was the first English writer to represent this dial, which appears in his translation of *Ars notoria: the notory art of Solomon*, 1657 (No. 144). The illustration there given differs from that of Cabeo in having the alphabet printed in capital letters.

Joseph Glanvill in *The Vanity of dogmatizing*, 1661, (No. 147), describes in full detail the magnetic sympathetic telegraph.* He adds that while the telegraph "may not yet answer the expectation of inquisitive *experiment*; yet 'tis no despicable item, that by some such way of *magnetick efficiency*, it may hereafter with success be attempted, when *Magical History* shall be enlarged by riper inspections: and 'tis not unlikely, but that present discoveries might be improved to the performance." This passage has been relied upon by those who would assign to Glanvill an early anticipation of the modern telegraph. The author then proceeds to describe a still more curious method of sympathetic communication, known as the *flesh* telegraph. This form is alluded to by Paracelsus in his *De secretis naturæ mysteriis*, 1570, and is said to have found credence with Rosicrucians and other esoterics of the seventeenth century. The description by Glanvill is as follows:

"There is besides this another way, which is said to have advanced the *secret* beyond *speculation*, and compleated it in *practice*. That some have conferred at distance by *sympathized hands*, and in a moment have thus transmitted their thoughts to each other, there are late specious relations to attest it: which say, that the hands of two friends being *sympathized* by a transferring of *flesh* from one into the

* See Vol. I., p. 130 for a reproduction of a page of this description.

other, and the place of the *letters* mutually agreed on; the least prick in the hand of one, the other will be sensible of, and that in the same part of his own. And thus the distant friend by a new kind of *Chiromancy* may read in his own hand what his correspondent had set down in his. For instance, would I in *London* acquaint my intimate in *Paris*, that *I am well*: I would then prick that part where I had appointed the letter [*I*:] and doing so in another place to signifie that word was done, proceed to [*A*,] *thence to* [*M*,] and so on, till I had finisht what I intended to make known."

The sympathetic telegraph was alluded to by many writers down to the nineteenth century. Among the contributions to the subject, the best known, in addition to those cited above, are by Daniel Schwenter in his *Steganologia* (No. 73), by Famianus Strada in his *Prolusiones academicæ*, 1617 (No. 90), and by Addison in the *Spectator*, 1711 (No. 874).

Below is given a list of writings in which such references or descriptions occur, including a few titles not in the A. I. E. E. Library. The number prefixed to each entry denotes the year of publication of the first edition; in brackets are given the catalogue number and the page on which a reference occurs. A list is also given of notable references to the writings in general of Porta, Schwenter and Strada.



REFERENCES TO THE SYMPATHETIC TELEGRAPH

1558. Porta, J. B. *Magiæ naturalis* libri IIII. (No. 47, pp. 88-90.) *Naples, 1558*
—Another edition. (No. 47a, pp. 73-75.) *Antwerp, 1560*
—Another edition. (No. 47b, pp. 73-75.) *Antwerp, 1561*
1589. Porta, J. B. *Magiæ naturalis* libri XX. (No. 64, p. 128.) *Naples, 1589*
Porta gives the first clear description of the sympathetic compasses.
—Another edition. (No. 64a, p. 289.) *Frankfort, 1607*
—Another edition. (No. 64b, p. 190.) *London, 1658*
1599. Panciroli, G. *Rerum memorabilium sive deperditarum*. (No. 98, p. 237.) *Frankfort, 1629-1631*
1600. Sunde, J. H. (*i.e.*, Daniel Schwenter) *Steganologia et steganographia*. (No. 73, p. 127.) *Nuremberg, 1600*
"He calls the attention of his correspondent by ringing bells by means of bar magnets. His needles are also moved by bar magnets, and the letters are formed by one, two, or three strokes to the right or left as in Cooke & Wheatstone's system. His ideas are purely cabalistic, but his curious anticipations of the modern telegraph are very singular."—*Latimer Clark*.
1609. Boodt, A. B. de. *Le parfaict joaillier*. (No. 120, p. 598.) *Lyons, 1644*
1609. Boodt, A. B. de. *Gemmarum et lapidum historia*. (No. 120a, p. 464.) *Leyden, 1647*
Latin translation of the above work by A. Toll.
1610. Arlensis, P. *Sympathia septem metallorum*. (No. 82, p. 275.) *Paris, 1610*
1617. Strada, F. *Prolusiones Academicæ*. (No. 90, p. 306.) *Lyons, 1617*
The well known poem on the lover's telegraph.
1624. Van Etten. (*i. e.*, Jean Leurechon.) *Récréation mathématique*. (No. 93, p. 94.) *Paris, 1626*
—Another edition. (Critical edition by Claude Mydorge.) *Paris, 1630*
—Another (5th) edition. (No. 93a, p. 161.) *Paris 1659*
—Another edition. (English translation.) (No. 93b, p. 104.) *London, 1633*
—Another edition. (English translation.) (No. 93c, p. 106.) *London, 1674*
1629. Cabeo, N. *Philosophia magnetica*. (No. 97, p. 302.) *Cologne, 1629*
Contains the first drawing of the sympathetic telegraph.

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1630. Hakewill, G. An apologie or declaration. (No. 99, p. 286.)
Oxford, 1630
1630. Mydorge, Cl. Examen du livre des récréations mathématiques.
(No. 101, problem 74, pp. 140-144.) Paris, 1630
1631. Kircher, A. Ars magnesia. (No. 102, pp. 35-36.)
Wurtzburg, 1631
1632. Galileo, G. Systema cosmicum. (No. 108, p. 88.) Strasburg, 1635
1636. Schwenter, D. Deliciae physico-mathematicæ. 3 vols. (No.
110bis, Vol. I, p. 347.) Nuremberg, 1636-1692
1637. Servius, P. De natura artisque miraculis. See pages 336, 456
of theatricum sympatheticum auctum. (No. 152.)
Nuremberg, 1662
1638. Fludd, R. Philosophia moysaica. (No. 112, Sec. II, lib. ii, memb.
ii, cap 5; and Sec. II, lib. ii, passim.) Gouda, 1638
1641. Kircher, A. Magnes sive de arte magnetica. (No. 116, p. 382.)
Rome, 1641
—Another edition. (No. 116a, pp. 281, 536 and ff.)
1641. Wilkins, J. Mercury. (No. 117, p. 146.) London, 1641
—Second edition. (No. 117a, p. 147.) London, 1694
1646. Browne, Th. Pseudodoxia epidemica. (No. 123, p. 76.)
London, 1646
1657. Turner, R. Ars notoria. (No. 144, p. 136.) London, 1657
The first English writer who gives a figure of the magnetic dial.
- 1657-1659. Schott, G. Magia universalis naturae et artis. 4 vols.
(No. 184, Vol. IV, p. 49.) Bamberg, 1677
Copied from de Sunde and Kircher.
1661. Glanvill, J. The vanity of dogmatizing. (No. 147, p. 203.)
London, 1661
- 1662-1663. Westen, W. van. Mathematische vermaecklyckheden. (No.
151, p. 128.) Arnheim, 1662-1663
1665. Glanvill, J. Sceptsis scientifica. (No. 147a, p. 149.)
London, 1665
1665. Schott, G. Schola steganographica. (No. 190, pp. 258-260.)
Nuremberg, 1680
His description is copied from de Sunde.
1676. Heidel, W. E. Trithemii steganographia. (No. 180, p. 358.)
Mayence, 1676
1682. Hiller, L. H. Mysterium artis steganographicae. (No. 193.)
Ulm, 1682
See Preface. This book is referred to in de Sunde, 1640.
1684. de Lanis, Fr. Magisterium naturae et artis. 3 vols. (No. 197,
Vol III., p. 412.) Brescia, 1684-1696

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- 1684.(?) Marana, J. P. Letters writ by a Turkish spy. 9 vols. (No. 282, Vol. I., p. 116.)
London, 1734
1696. Vallemont, P. de. La physique occulte. (No. 206a.) *Paris, 1696*
The Paris edition 1696 has an appendix (not in the 1693 edition), which on page 32 gives an account of the sympathetic telegraph.
- 1701-1702. Le Brun, P. Histoire critique des pratiques superstitieuses. 2 vols. (No. 225, Vol. I., p. 293.)
Rouen, 1701-1702
1711. The Spectator. Reprint. (No. 874, p. 345.)
London, 1832
The well-known and interesting account of the sympathetic telegraph appears in the number dated December 6, 1711.
1718. Albertus Parvus. Les secrets merveilleux. (No. 407, p. 228.)
Lyons, 1762
1723. Santanelli, F. Philosophiae reconditae. (No. 261, Chap. IV.)
Cologne, 1723
1731. Reibelt, J. J. A. De physicis et pragmaticis magnetis mysteriis. (No. 278, Part I., p. 98.)
Wurtsburg, 1731
1736. Bailey, N. Dictionarium Britannicum. (No. 286.) *London, 1736*
See the word *lodestone*.
1744. Akenside, M. The pleasures of the imagination. (No. 597.)
London, 1796
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Library of the American Institute of
Electrical Engineers

REPORT OF LIBRARY COMMITTEE, 1903

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

REPORT OF LIBRARY COMMITTEE

WE beg to submit herewith a report on the present condition of the Library of the Institute, including a statement of receipts and expenditures from the inception of the Library to May 1, 1903; statistics as to the number of volumes and titles; valuation of books and fixtures; statement of sources from which the books have been derived, etc. Owing to the extraordinarily rapid manner in which the Library has sprung up, an immense amount of detail has been involved in establishing it on a firm basis with respect to records, collation of periodicals, cataloguing and other work necessary to place the collection in permanent order and efficient working condition, as well as to determine the additions immediately desirable of modern books and those necessary to fill out incomplete sets of periodicals and Transactions of learned societies. This work is now so far advanced as to admit of the compilation of the statistics submitted herewith. As this is the first report which the Library Committee has rendered, it may not be amiss to place on record here a brief account of the inception and growth of the Library.

At a meeting of the Council in January, 1900, \$500 was appropriated for the purchase of two book stacks and to defray the cost of binding the more important of the periodicals received in exchange for the Institute *Transactions*, and which for years had been accumulating. At the same time a Library Committee was named to carry out this work. Previous to the appointment of the Committee the Institute had a miscellaneous collection of several hundred books, largely the gift of the late Mr. George B. Prescott, Jr., and of publishers, together with several bound sets of electrical periodicals. In January, 1901, the Committee asked for another appropriation of \$500, but receiving only \$100, it was

decided that an endeavor should be made to enlist the interest of individual members in building up the Library. Though no general appeal was made, the response from the beginning was extremely encouraging, and the result to date is indicated in the statement that of 8,139 volumes now in the Library, all but 1,653 are the gift of individual members, this latter number including exchange periodicals and 395 volumes purchased from the Carnegie fund; aside from bound exchange periodicals, only 14 volumes have thus far been purchased from Institute funds. The list of donors to date includes 57 names.

The first gift received was a complete set of *Comptes Rendus* (140 volumes) from Mr. C. O. Mailloux, followed soon after by a set of the *Proceedings* of the Royal Society from Mr. Edward Caldwell, and a set of the *American Journal of Science* and *Journal* of Franklin Institute from Dr. Cary T. Hutchinson. During the first three months the gifts aggregated almost 500 volumes.

The latter part of February, 1901, it was learned that the celebrated Latimer Clark Collection of electrical books, pamphlets, autographs and portraits was for sale, and the matter of its purchase for the Institute was immediately brought to the attention of Mr. Andrew Carnegie. While the negotiations with Mr. Carnegie were proceeding, but yet in doubt, Dr. Wheeler purchased the collection, and signified his intention of presenting to the Institute the books and pamphlets contained therein. Subsequently, a favorable reply was received from Mr. Carnegie, and when a committee called to inform him of the circumstances under which the collection had just been bought, he expressed much admiration for the *esprit du corps* exhibited by Dr. Wheeler; and the suggestion having been made that a fund would be desirable with which to house, catalogue and complete the collection, he immediately said he would donate for that purpose a sum equal to the expenditure of Dr. Wheeler. When the total cost, \$6,880.28, was finally determined and communicated to Mr. Carnegie, he gave his check for that amount. Of this sum \$828.10 has been expended for book stacks and library fixtures, \$3,500 was set aside for the bibliography of the collection, and the remainder was reserved for book purchases.

At the annual meeting, May 21, 1901, Dr. Wheeler presented to the Institute the books and pamphlets of the Latimer Clark

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collection, subject to certain conditions set forth in a Deed of Gift, as follows: [The Deed of Gift follows the title-page of Vol. I. of this Catalogue.]

For the information of members, a check list was printed in the Institute *Transactions* of March, 1903, of the books and pamphlets in the Wheeler Gift published prior to 1826, including somewhat more than 900 titles. Dr. Wheeler has recently authorized the Library Committee to purchase at his cost such works as will make his gift as completely representative as possible of early electrical literature, and a list of such works is now being compiled.

The bibliography of the Wheeler Gift is now under preparation at the hands of Brother Potamian, Sc.D., Lond., Professor of Physics in Manhattan College, New York, a distinguished authority on early electrical literature. Each title will be accompanied by a note characterizing the contents of the volume, or indicating the feature that constitutes its value or celebrity. As the collection is particularly rich in the literature of early electrical science and in the pamphlet literature relating to the beginnings of the electrical arts, the work promises through its annotations to have a unique value aside from its character as a catalogue. In accordance with the terms of the Wheeler Deed of Gift, a copy will be given without charge to each member of the Institute.

Next to the Wheeler Gift in importance are the various donations by Mr. C. O. Mailloux, which are almost completely inclusive of the great *Transactions* of French scientific bodies. In addition to the *Comptes Rendus* above referred to, the list includes complete sets of *Annales de Chimie et Physique* (317 volumes); *Journal de Physique* (29 volumes); *Mémoires de l'Académie des Sciences* from 1666 to date (250 volumes), lacking only the volumes for the years 1778-1795, which Mr. Mailloux has authorized the Library Committee to obtain at his cost when they come on the market; *Mémoires présentés à l'Académie des Sciences par Divers Savants* (34 volumes); *Proceedings* of the Austrian Society of Engineers (56 volumes); a complete set of *Zeitschrift für Instrumentenkunde* (25 volumes); and a number of early works relating to learned societies. Mr. Mailloux has also defrayed the cost of binding or rebinding several hundred volumes of his gift.

In order to keep up the several sets of his gift, Mr. Mailloux has presented to the Library a fund of such an amount that its

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annual proceeds will defray the cost of future subscriptions to the various publications and the cost of binding the yearly additions.

Mr. Edward D. Adams has donated a complete set in splendid condition of all the publications of the Royal Society. These include the *Transactions*, unabridged, from 1665 to date (223 volumes); *Proceedings* of the Royal Society (70 volumes); Royal Society *Catalogue of Scientific Papers* (12 volumes); and a complete set of the various *Histories* of the Society—six in number (10 volumes)—the total aggregating 315 volumes. Mr. Adams defrayed the cost of rebinding the above uniformly in half morocco with gilt tops, and is also having engraved at his cost by Mr. E. D. French a book plate for the Library.

The American Bell Telephone Company presented a valuable collection (92 volumes) relating to the telephone, including Records, Briefs, etc., of telephone suits, and rare early publications and papers relating to the telephone; also 15 volumes of electric railway patent specifications from the earliest issue to 1896.

Through the gift of five patent attorneys the Library has come into possession of a set of U. S. Electrical Patent Specifications from the earliest issue up to June 30, 1891.

Mr. Joseph Wetzler presented a complete set of Dingler's *Polytechnisches Journal*, 1820-1901 (319 volumes), and from Mr. Charles L. Clarke has been received a valuable collection of 40 volumes of Records, Briefs, etc., relating to incandescent lamp litigation.

Mr. Bion J. Arnold has donated 5,000 marks for the purchase of a complete set of *Annalen der Physik* from 1790 to date. This set includes all of the rare early volumes, all indexes and all supplementary volumes.

From Mr. Thomas A. Edison a complete set of the valuable Italian periodical, *Nuovo Cimento*, has been received.

Following is a list of donors to May 1, 1903:

Adams, Edward D.
Amer. Bell Tel. Co.
American Electrician
Anderson, G. L.
Arnold, Bion J.
Auerbacher, L. J.
Bolton, H. C.

British Patent Office.
Brown, C. S. V.
Brown, J. Stanford.
Buckingham, C. L.
Caird, R.
Caldwell, Edward
Clarke, Chas. L.

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Conservatoire des Arts et Metiers.	Martin, T. C.
De Vinne, Theo. L.	Nat'l Acad. of Science.
Dunod, Vve.	Naud, C.
Dunbar, J. W.	N. Y. Electrical Society.
Dyer, R. N.	Office Naval Intelligence.
<i>Electrical Review</i>	Pope, Ralph W.
<i>Elec. World and Eng.</i>	Reber, Col. Sam'l.
Fish, F. P.	Rosenbaum, W. A.
Gauthier-Villars.	Sheldon, Prof. Sam'l.
Griffin, Chas. & Co.	Société Française de Physique.
Howson & Howson.	Stieringer, Luther.
Hutchinson, Dr. Cary T.	U. S. Coast and Geodetic Survey.
Jenks, W. J.	Van Nostrand Co., D.
Johnston, W. J.	Varley, Richard.
Keith, Dr. N. S.	Wakeman, J. M.
Kinsman, F. E.	Waldo, Dr. Leonard.
Lawrence, W. J.	Weaver, William D.
Lockwood, T. D.	Wetzler, Joseph.
Lozier, R. T. E.	Wheeler, Dr. Schuyler S.
Macmillan Company.	Wiley & Sons.
Mailloux, C. O.	Wolcott, Townsend.
McGraw Pub. Co.	

All gifts received are acknowledged in the *Transactions* of the Institute, the titles being accompanied, when thought advisable, by a note pointing out the scope of, or feature of interest in, a work. In case of gifts of *Transactions*, periodicals, etc., including a considerable number of volumes, the name of the donor is stamped on the back, thus giving to the collection an individuality and at the same time denoting the *esprit de corps* to which the Library owes its existence.

The policy of the Library Committee is to endeavor to make the collection so complete in all the original sources of electrical knowledge that it will be invaluable for purposes of historical and scientific research. To this end particular attention is at the present time being paid to obtaining sets of the *Transactions* of the more important of the older learned bodies of the world, which up to about the middle of last century were almost the sole repositories of electrical knowledge. Owing to the demands of the libraries connected with technical courses, particularly those of the many technical schools now being organized in Europe, the rarity of these publications is rapidly becoming greater, and the

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indications are that in a few years the more important will be unobtainable.

So far as funds available will permit, there will be placed in the Library complete sets of the more important electrical periodicals which have been published during the past half century. About sixty of the leading current electrical and cognate periodicals are now bound annually. The greatest effort will be made to obtain for the Library copies of the records and briefs of all electrical American patent litigation, which are of extreme value with relation to the history of the art; and it is hoped eventually to place in the Library the electrical patent publications of the leading countries of the world. Finally, the plans include having the collection eventually contain every book and pamphlet that has been printed in this country relating to electricity.

To provide a complete working electrical library for engineers, lists as full as has been possible to compile have been made of all authoritative works in the English, French and German languages now in print and not in the Library relating to electrical engineering and science. Recently several hundred volumes in the French and German languages have been placed on the shelves, which include the more important modern works in these languages. Part of an extensive list of English and American books has already been purchased, and during the year what funds are set aside for this purpose will be expended in further purchases. As received, a list of the books purchased will be printed in the monthly *Transactions* of the Institute.

The Library is now housed in three rooms of the suite occupied by the Institute at 95 Liberty Street. The space is ill adapted for Library purposes, and the room available for additions will probably all be taken up by the end of the current fiscal year. At present the books are being arranged on the shelves so far as possible in classes corresponding to the main divisions of electrical science and engineering. An author catalogue of the collection has been completed, but the matter of a subject catalogue has not yet been taken up. In view of the rapid rate at which the collection is growing, and the fact that those referring to the books with few exceptions do not need the same guidance as the patrons of the usual public library, the compilation of a subject catalogue can, it is thought, be well deferred to a later date.

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The greatest present need is an index to the various sets of scientific Transactions and to the more important articles in the sets of the leading electrical periodicals. The Library Committee hopes at some time in the future to enlist the interest of some friend of the Institute in the matter of supplying this need by the donation of an endowment fund for the compilation and publication of keys to these classes. Some years would be required to compile and publish keys to the Transactions and periodicals, after which the proceeds of the endowment might be devoted to printing monthly an index to the periodical electrical and physical literature of the world, including papers read before the learned bodies of the world. While the plan of such publication has not yet been worked out in all of its details, the main idea is an index in which the entries would be as brief as consistent with their object in pointing out to a reader if the paper or article is one which would interest him—thus not having the character of abstracts; and arrangements would be made with some book-selling firm or firms for the sale of coupon books, and the issue of a list of all journals covered by the index, together with the prices at which copies would be supplied upon application.

Another extremely desirable addition to the Library is a complete set of U. S. Electrical Patent Specifications, and provision for keeping up the same, including binding. The beginning of such a collection has already been provided for through the generosity of the patent attorneys above referred to, and it is hoped to obtain from some friend of the Institute a sum sufficient to complete the collection and provide an endowment fund for its continuation in the future.

Following are given statistics of the Library under the heads of source, titles, volumes and valuation. The duplicates, which are all separately catalogued and carefully stored, furnish a nucleus for a branch of the Library which some time in the future may be considered. With this in view it is hoped in time to fill out the incomplete sets of periodicals comprised.

In making up the valuation of the collection as given in the accompanying table, the following system was pursued:

The Wheeler Collection is valued at its cost, and similarly where books were specially purchased for donation to the Library, the price paid by the donors for the same is entered. In the case of other

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STATISTICS OF LIBRARY

SOURCE	Titles	Volumes	Valuation
OLD LIBRARY:			
Books	213	231	\$265.00
Periodicals	6	90	180.00
PURCHASES:			
Carnegie Fund.....	7	395	862.85
Institute Appropriations.....	14	14	33.22
Periodicals. Bound.....	72	923	1,846.00
S. S. WHEELER:			
Latimer Clark Collection } Books.....	1943	2048	} 6,880.28
} Pamphlets.....	3450	195	
} Periodicals.....	91	1378	
Recent Additions.....	62	74	120.25
GIFTS:			
Edward D. Adams.....	9	315	2,019.06
American Bell Telephone Co.....	39	107	500.00
Chas. L. Clarke.....	8	40	100.00
Cary T. Hutchinson.....	88	371	643.94
Nathaniel S. Keith.....	43	55	100.00
C. O. Mailloux.....	12	850	1,803.23
McGraw Publishing Co.....	59	192	241.45
New York Electrical Society.....	51	54	52.50
W. D. Weaver.....	75	127	178.75
Joseph Wetzler.....	1	319	245.00
F. P. Fish	} U. S. Electrical Patent Specifications...	97	500.00
W. A. Rosenbaum			
Howson & Howson			
R. N. Dyer			
C. L. Buckingham	} Miscellaneous Gifts, (42 donors).....	264	299.25
Miscellaneous Gifts, (42 donors).....			
	6377	8139	\$16,870.78
Duplicates	178	412	659.68
Total	6199	7727	\$16,211.10

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books, the valuation is based on the wholesale price of books now in print, and on what it was thought the books out of print could be procured for if for sale at second hand. The newly bound volumes of periodicals were uniformly entered at \$2.00 per volume, and those in older binding at this or a less price, depending upon the state of the binding. The donations consisting largely of patent records and specifications, such as those of the American Bell Telephone Company, and Mr. Charles L. Clarke and Dr. Nathaniel S. Keith, have been given arbitrary values, which in each case is thought to be well within a price which a public library would be willing to pay for any of the several collections.

* * * * *

Respectfully submitted,

WM. D. WEAVER, *Chairman.*

W. J. JENKS,

CHAS. E. KNOX,

LEONARD WALDO,

NOTE—Mr. Gano S. Dunn, member of the Library Committee, was abroad when this report was prepared and presented to the Board of Directors.

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American Institute of Electrical Engineers.
Library

Catalogue of the Wheeler gift of books.
v.2

DATE

NAME OF BORROWER

University of Toronto
Library

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